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TRANSACTIONS
OF THE
INTERNATIONAL CONGRESS
OF
PREHISTORIC ARCHÆOLOGY.

Third Session.

1868.

LONDON: PRINTED BY
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INTERNATIONAL CONGRESS
OF
PREHISTORIC ARCHÆOLOGY:

TRANSACTIONS

OF

The Third Session

WHICH

OPENED AT NORWICH ON THE 20TH AUGUST

AND

CLOSED IN LONDON ON THE 28TH AUGUST

1868:

CONTAINING

THE PAPERS READ AT THE CONGRESS, WITH ILLUSTRATIONS
CHIEFLY CONTRIBUTED BY THE AUTHORS, AND AN
ABSTRACT OF THE DISCUSSIONS.

LONDON:
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1869.

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INTERNATIONAL CONGRESS
OF
PREHISTORIC ARCHÆOLOGY.

ORIGIN AND DESIGNATION OF THE CONGRESS.

AT a meeting of the 'Société italienne des Sciences naturelles,' held at La Spezzia in the year 1865, it was proposed to found an International Congress, under the designation of 'Congrès paléoethnologique,' the general intention of which was thus expressed in the 'acte de fondation,' 'Article premier. Il est créé un Congrès international *pour les études préhistoriques.*' Under this title the Congress met at Neuchâtel in the year 1866, at the same time as the assembly of the Swiss Society of Natural Sciences. In the year 1867 the Congress was held in Paris during the Exposition Universelle, under the appellation of 'Congrès international d'Anthropologie et d'Archéologie préhistoriques.' In the year 1868, England having been fixed upon as the place of meeting, the Congress assembled at Norwich on the 20th August, at the same time as the meeting of the British Association for the Advancement of Science, and terminated in London on the 28th of the same month. With a view to enlist as

largely as possible the members of all the learned societies in this country which, under various denominations, treat of the particular studies which fall within the province of the Congress; and in order to carry out as broadly as possible the full scope and intention of the founders in establishing a Congress, '*pour les études préhistoriques*,' it was thought advisable that it should assemble during its third session under the title of 'International Congress of Prehistoric Archæology.'

THIRD SESSION,

TO OPEN AT NORWICH ON THURSDAY, AUGUST 20, 1868.

GENERAL RULES.

ARTICLE 1.—The Annual International Congress of Prehistoric Archaeology originated in the Meeting which took place at La Spezzia in 1865.

ART. 2.—The Congress is not to be held during two consecutive years in the same country.

ART. 3.—All persons who desire to become Members of the Congress can do so by paying the Annual Subscription, which will entitle them to take part in the Meetings of the Congress, and to receive its publications for that year.

ART. 4.—At the end of each Session the Congress shall name the country in which the next Session is to be held. And it shall also nominate, from amongst the Savants of the country designated, the President, and a Committee of Organisation for that Session.

ART. 5.—The Committee of Organisation is at liberty to increase its members by adding to the list, from time to time, the names of other Savants of the country. It is further empowered to ask the assistance of such foreign Savants as may be thought likely to secure the greatest number of Members for the Congress. These last shall be called Corresponding Members of the Committee.

ART. 6.—The Committee shall fix the period of the Session, the number of Meetings, and the rate of Subscription. It shall issue the necessary Notices, receive all communications, deliver the Members' Tickets, and transact all the business connected with the opening of the Congress and the arrangement of the Meetings.

ART. 7.—The Committee shall prepare and distribute, several months in advance, a Programme of the Meetings, and it may fix a certain number of the questions to be discussed; but it should reserve some of the Meetings for the consideration of other questions, not included in the Programme, which may be proposed by any Members of the Congress, and approved by the Council.

ART. 8.—The Officers of the Committee will perform their functions provisionally during the first Meeting of the Session. At this Meeting the Officers shall be finally elected by a majority of the Members present, with the exception of the President, already

appointed during the preceding Session, and the Treasurer, who has been named by the Committee of Organisation.

ART. 9.—The Officers of the Council shall be,—1st, the President; 2nd, six Vice-Presidents, of whom two at least shall be resident in the country; 3rd, a Chief Secretary; 4th, four Secretaries; and, 5th, a Treasurer.

ART. 10.—The Council shall consist of the Officers named in Art. 9, and six Members to be elected by Ballot. The following shall also be entitled to form part of the Council: viz. the four founders of the Congress of La Spezzia, and all the Presidents of former Sessions, which last shall be termed Honorary Presidents. Such Members of the Committee of Organisation as do not fall under any of the foregoing categories will also take part in the deliberations of the Council.

ART. 11.—All communications proffered and all questions raised during the Session shall be submitted to the Council, who shall decide upon them. The Council shall also propose for the vote of the Congress, in conformity with Art. 4,—1st, the country in which the next Session is to be held; and, 2nd, the nomination of a President and a Committee of Organisation for that Session.

ART. 12.—At the second Meeting of each Session, the Congress, upon the proposition of the Council shall appoint a Publication Committee, of which the Chief Secretary shall be *ex officio* President, and of which the Treasurer shall also be a Member. This Committee shall be composed entirely of Members of the country in which the Congress is held.

ART. 13.—Should there be any surplus funds, the amount shall be transferred to the account of the ensuing Session.

ART. 14.—All objects presented to the Congress during the Session, and all papers and other communications, shall belong to the country in which the Session is held. Their destination shall be determined by the Council.

ART. 15.—The Committee of Organisation of each Session shall regulate all matters that are not determined by these General Rules.

ART. 16.—Any proposal for modifying the General Rules shall be signed by at least ten Members, be hung up in the Meeting-room during the Session, and finally submitted for the consideration of the Council, who, after deliberating upon it, shall prepare a Report to be inserted, together with the proposal, in the publications of the Congress. The proposal shall be submitted to the vote of the Congress, without discussion, at the first Meeting of the ensuing Session.

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FOR THE SESSION OF 1868.

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PROGRAMME.

THE Third Session of the International Congress of Prehistoric Archaeology will open at Norwich on Thursday the 20th of August, and terminate in London on Saturday the 29th of August, 1868.

All persons who are interested in this branch of Science may become Members of the Congress by paying the Subscription, which is fixed for this year at Ten shillings and sixpence.

The receipt of the Treasurer will entitle the holder to a Member's Ticket, and to all the Publications of the Congress for the year.

The Corresponding Members of the Committee, and all who are interested in the particular studies which fall within the province of the Congress, are invited to obtain as large a number of Members as possible.

All persons desiring to become Members are requested to transmit by post, as soon as possible, the amount of their subscription to the Treasurer, W. Spottiswoode, Esq., F.R.S., 50 Grosvenor Place, London, S.W., at the same time forwarding in legible handwriting their Christian and Surnames, titles, profession or occupation, and address. The transmission of these details is necessary in order to make out a List of the Members, and to prepare the Members' Tickets.

Any Society wishing to secure the Transactions of the Congress may do so by paying the Annual Subscription.

The Members' Tickets, together with a detailed Programme of the Congress, will be distributed at Norwich. The Members' Tickets will be issued at the Reception-room of the British Association for the Advancement of Science.

It is not the intention of the Committee to fix beforehand any of the Questions to be discussed at the Congress. With the view, however, of affording the members some assistance in selecting the subjects for their communications, the following List of Subjects, appearing, in the opinion of the Committee,

to fall especially within the province of the Congress, is published for general information :—

1. The Earliest Traces of the Existence of Man.
2. Researches in Caverns inhabited at a remote Period by Man.
3. The Structural Character of Primeval Man.
4. The Character of the Fauna associated with him.
5. Megalithic Monuments.
6. Stone and Bronze Antiquities, their Character and Uses.
7. Earliest Use of Iron in Britain.
8. Early Habitations.
9. Intrenchments, and Implements of War.
10. Early Methods of Interment.
11. Existing Customs and Implements as Illustrations of Prehistoric Times.
12. Indications of continuous Progress in Arts and Civilisation during successive Prehistoric Periods.

All Persons desiring to bring forward Communications on these or any other questions of a similar nature, must transmit their Written Communications to the Secretary before the 5th of August, in order that a detailed Programme of the Meetings may be issued at the same time as the Members' Tickets.

It may be well to mention that the International Congress of Prehistoric Archæology will take place at the same time as the Meeting of the British Association for the Advancement of Science, which opens at Norwich on Wednesday, the 19th of August, and closes on Wednesday, the 26th of August.

As it is desirable that the funds obtained by the subscriptions should be, as far as possible, devoted to defraying the expenses of the publications, any donations towards the general expenses of the Congress will be thankfully received.

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INTERNATIONAL CONGRESS OF PREHISTORIC ARCHÆOLOGY.

FIRST MEETING.

THURSDAY, AUGUST 20, 1868.

SIR JOHN LUBBOCK, BART., F.R.S., PRESIDENT, IN THE CHAIR.

THE first meeting of the Congress commenced at 2 P.M. in the Public Library, Norwich, in the presence of the President and ex-President of the British Association for the Advancement of Science and a large assembly of the members of the Congress.

THE PRESIDENT (Sir John Lubbock) then delivered an address to the following effect:—

Those, he said, who were present at Dr. Hooker's address last evening would have heard the general protest made by him against the opening addresses which had hitherto been customary at the meetings of the British Association. He himself had not intended to deliver any address on this occasion, because he was unwilling to tie down those who might come after him. During his absence from England, the Committee had, however, made arrangements which he thought, on the whole, eminently satisfactory, though in one part he should have liked to make an alteration. He found

the programme for to-day's proceedings contained nothing except routine business and the President's Address.

It became, therefore, his duty to offer some preliminary observations on the History and Objects of the International Congress of Prehistoric Archæology, and the science with which it deals. This Association took its rise at a meeting held at Spezzia; a second meeting had been held at Neuchatel, and another at Paris. Following the rule of the British Association never to meet two succeeding years in the same place, the rule of this Association was never to meet two successive years in the same country. A President was appointed at each meeting for the next, and thus he appeared as the president on this occasion.

It was hardly necessary for him to point out the advantages of this Association. In the first place, it brought together those who were interested in the same Science; it enabled them to examine the various objects of interest in the place where they met, and to compare ideas upon this most interesting branch of science. The presence of his friend Professor Nilsson was a proof that neither age nor distance could prevent men of science from attending these conferences.

During the last year they had had to deplore the loss of some of their most eminent fellow-labourers. He should not refer to all those who had been taken from them, but he found it impossible not to allude to the loss of M. Boucher de Perthes and Mr. John Crawford.

There were two principal heads into which the subject of their investigation was divided—one concerning savages in ancient times, and the other relating to savages in modern times; and in their inquiries they endeavoured to trace up the development and growth of the human race to the present time.

Archæologists are regarded by many as mere speculative and visionary enthusiasts. Dr. Hooker, in the Address which he had delivered on the preceding evening, did them, however, no more than justice when he commended the sober spirit and method in which they prosecuted their studies, and he begged to thank him for the terms in which he had referred

to their Association. Dr. Hooker stated that they were pursuing their studies in a scientific spirit, and by the use of scientific methods. He should endeavour to satisfy his hearers that this was really the case, and that they had solid grounds for the faith that was in them.

The Duke of Argyle, on the contrary, in some articles communicated to a popular periodical entitled 'Good Words,' had expressed a very different opinion. The Duke said, 'I must observe that archæologists are using language on this subject which, if not positively erroneous, requires at least more rigorous definitions than they are disposed to attend to. They talk of the Old Stone Age (Palæolithic), and the Newer Stone Age (Neolithic), and of the Bronze Age, and of the Iron Age. Now there is no proof whatever that such ages ever existed in the world.' He further says, 'If it were true that the use of stone has in all cases preceded the use of metals, it is quite certain that the same age which was an age of stone in one part of the world was an age of metal in another. As regards the Eskimo and South-Sea Islanders, we are now, or were very recently, living in a Stone Age.' As the Duke had referred to two terms which he (Sir John) had ventured to suggest, he would read to the meeting the sentences in which he had proposed those two terms, and it would be found that he had used them in the same sense, and with the same limitations, as the Duke.

His words were ('Prehistoric Times,' p. 2): 'From the careful study of the remains which have come down to us, it would appear that Prehistoric Archæology may be divided into four great epochs.

Firstly, that of the Drift; when man shared the possession of Europe with the mammoth, the cave-bear, the woolly-haired rhinoceros, and other extinct animals. This we may call the Palæolithic period.

'Secondly, the later or Polished Stone Age; a period characterised by beautiful weapons and instruments made of flint and other kinds of stone, in which, however, we find no trace of the knowledge of any metal except gold, which seems to have been sometimes used for ornaments. This we may call the Neolithic period.

‘Thirdly, the Bronze Age, in which bronze was used for arms and cutting instruments of all kinds.

‘Fourthly, the Iron Age, in which that metal had superseded bronze for arms, axes, knives, &c.

‘Stone weapons, however, of many kinds were still in use during the age of Bronze, and even during that of Iron ; so that the mere presence of a few stone implements is not in itself sufficient evidence that any given ‘find’ belongs to the Stone Age. In order to prevent misapprehension, it may be well to state at once that, for the present, I only apply this classification to Europe, though in all probability it might be extended also to the neighbouring parts of Asia and Africa. As regards other civilised countries, China and Japan for instance, we as yet know nothing of their prehistoric archæology. It is evident also that some nations, such as the Fuegians, Andamaners, &c., are even now only in an age of Stone.’

Other archæologists had also expressed themselves with the same degree of caution. He thought, therefore, the Duke could not sustain the charge he had brought against them. The Duke was entirely at one with archæologists as to the antiquity of the human race ; he only differed from them on the subject of their divisions of the prehistoric ages. We are in the habit of speaking of the ‘Christian era ;’ but suppose we were to object to the use of that term in the same way as the Duke objects to the use of the term ‘Stone Age.’ We have heathens and Christians existing at the same time, but that was no reason why we should not use the term ‘Christian era.’

What are the reasons that lead us to consider that we can detach those ages from each other, and consider each of them as one period in the course of man’s history ? The objects referred to the Palæolithic Age are implements of stone which have been found in strata of gravel both in England and in France. One objection raised was, that there was no evidence that they had been made by man. In the same way, there were persons who said there was no evidence that the pyramids were built by man. It was as certain that the flint implements were made by men as that the pyramids were built by men. It was a familiar fact that

pebbles worn by the operations of nature were not angular, but round. Mr. John Evans would read a paper in which he would bring this subject before them, and, in fact, he would make some flint implements. Then it was said that these implements were forgeries. Some of them, doubtless, were so. But the great majority were undoubtedly genuine, and some had been found by archæologists themselves; others also were stained at the surface like the other flints by which they were surrounded. Flint implements closely resembling those found in England and France had also been discovered in Spain and India. Now, the implements of the *Palæolithic Age* were never found with pottery, and were never ground. Putting these facts together—the peculiar form of the implements, the position in which they occur, their never being polished, their never being found with pottery—it is a legitimate inference that these things correspond to a peculiar phase of human history. Then, if we examine the animals that coexisted at this period, we shall find that they embraced nearly all the animals still in Europe, and it would be therefore remarkable indeed if man had not coexisted with them. But with these occurred also the remains of animals not now in existence in this country, as, for instance, the mammoth, the woolly-haired rhinoceros, the hippopotamus, the cave bear, the reindeer, the glutton, and the musk ox. Some of these species were now altogether extinct. Thus, the existence of man was proved in these early ages by certain flint implements which were found to be associated with certain groups of animals not now existing in this part of the world.

We now come to the *Neolithic* or *Polished Stone Age*. It was said that some of the great tumuli in which these polished implements were found were made by people in possession of metal, because the hard stone was engraved with figures: it had, however, been shown, that these engravings could be made with flint implements, but not with those of bronze. Moreover, where perhaps a hundred flint implements were found in one chamber of a tumulus, it was probable that the people who made it knew nothing of metal, because, while they were supplying their deceased friends with all kinds of implements necessary to them, if they had had metal imple-

ments they would have deposited some with those of stone. The evidence derived from the shell mounds of Denmark was even stronger, as thousands of flint implements had been found in them without any trace of metal. In the Swiss lake villages, also, thousands of these implements had been dug up. It had been thought that these implements were merely symbols, but the number of them altogether precluded this idea. Moreover, many showed clear indications of use, having been broken and then again ground. This showed conclusively that these implements were intended for actual use, and not as symbols. This fact would be more clearly apprehended by those who compared them with the implements now in use among savages, and moreover it would also be found that they included those of every kind required in savage life. They differed from those of the first age partly in form and partly in being polished. There were also other indications that they belonged to a people further advanced in civilisation. Thus pottery was in use, and spindle-whorls had also been found. When the fauna also was compared, it was found that the elephant, the rhinoceros, the reindeer, &c., had disappeared. In these facts we had all the necessary materials for separating this age from the Palæolithic.

But how should we separate this age from the *Metal Age*? We were enabled to do so by the same kind of evidence. The tumuli and the Swiss lake villages of the Bronze Age were conclusive proofs on this point. If the knowledge of metal had been gradually and slowly introduced by its discovery on the spot, then copper would have preceded bronze, the latter being a compound of the former with tin. As far, however, as Western Europe was concerned, while we had thousands of bronze implements we had but very few of copper, and none of tin. Then it might be said that the only difference was, that the inhabitants who dwelt where metal implements are found were rich, while where those of stone only are found they were poor. There were, however, several indications that the people who used the bronze were in a higher state of civilisation than those who used the stone. The pottery is better, the ornaments more skillfully made, and the animals and plants different. There

were also certain negative facts which separated this age from the preceding one. In the time of the Romans the inhabitants north and south of the Alps were well acquainted with gold, silver, lead, and zinc, and used coins; and not any of those things had been found among the people of the Bronze Age.

Then we might ask how the bronze was introduced into Europe, and the knowledge of it brought to us. Professor Nilsson was of opinion that its introduction was due to commerce with the Phœnicians; but if so, it was at a very early period of their history. He had not hitherto alluded to the evidence of ancient writings. There was, however, frequent mention made of bronze in the Pentateuch, but very seldom—he believed in only four instances—was reference made to iron. It was hardly necessary to say that, as soon as iron was introduced, it would replace bronze because it was a better cutting substance. There were weapons made partly of bronze and partly of iron, and in the cases in which they were mingled the handle was made of bronze and the blade of iron. Of course there must have been a period when the use of bronze was gradually giving way to the use of iron. There was one remarkable case in which we found an evidence of this process going on. This was at Halstatt in Austria, where iron and bronze implements were found associated together. The ornaments, also, were of an intermediate character. Still no letters were found, no coin, no silver, no lead, no zinc. Then we had cases in which large quantities of *iron* implements and weapons had been discovered.

The President then proceeded to read some figures exhibiting the number of implements discovered in various places. At Wangen in Switzerland there had been found 1,600 objects of stone besides a great many of bone, but no trace of bronze or iron. At Nidau, on the lake of Neuchatel, there were only 33 stone axes, and a total of stone implements of 368, while there were no less than 2,004 objects of bronze, of which no fewer than 1,420 were ornaments. The presence of this large number of ornaments was an indication of an advance in civilisation. At Marin, on the same lake, with several ornaments of bronze, 250 objects of iron had been

discovered, consisting of swords, axes, knives, and 100 ornaments. This was the only case among these lake villages in which coins had been discovered. At Nydam, in Schleswig, at a place where a battle had been fought, or where arms had been hidden, there had been discovered about 30 iron axes, 80 knives, 80 swords, and 500 lances, but no single weapon of bronze.

Taking these evidences, he thought they would give an idea of the nature of the facts on which they built their conclusions. He thought that they clearly proved that they had sufficient reason to believe that there were four great pre-historic periods. Nor could he omit to mention that there was some reason for believing that man existed in Europe even during the Miocene period. This, however, was not so clearly established. They did not, indeed, profess to have obtained a complete mastery over this science; they were humble students collecting evidence, and were quite ready to abandon their views if shown to be untenable.

The study of modern savages also threw much light on the condition of man in times long gone by. Time, however, did not permit him to discuss the habits, manners, and customs of existing savages, and the light they were calculated to throw either upon those of early times, or on certain peculiarities existing even amongst ourselves.

The President concluded his address by speaking of the necessity of studying these peculiarities, and preserving the fast-perishing remains of antiquity, which, however, were perishing scarcely faster than the savage tribes of the human race, changing as they were under the influence of the missionary and the spread of commerce. Many of the Druidical monuments had been already destroyed, and the remainder should be studied while the opportunity remained. 'Fire-water' and disease were rapidly diminishing the number of savages, and their character was fast becoming modified, so as to lose its peculiarities. Sheffield blades and other products of civilisation were being introduced among them and superseding their own native articles.

The savage in his native dress, with his rude arms and quaint ornaments, has a certain natural dignity and barbaric magnificence which he loses entirely when he bedizens

himself in the rags and tatters of civilisation; and so also the very errors and superstitions of savages have an interest and importance of their own, which they lose at once when they become mingled with, and distorted by, the errors and superstitions even of higher races.

The great aim of those who instituted this Congress was to study these things, to preserve the objects of prehistoric times, and all authoritative records connected with them.

At the conclusion of the address, the President proposed to the meeting a list of the officers and Council for the session, which was put to the vote and carried.

The Duke of Buccleuch, ex-President of the British Association for the Advancement of Science, then proposed a vote of thanks to the President, Sir John Lubbock, which was seconded by Mr. John Evans, and carried.

SECOND MEETING.

FRIDAY, AUGUST 21, 1868.

SIR JOHN LUBBOCK, BART., F.R.S., PRESIDENT, IN THE CHAIR.

The Meeting commenced at 11 A.M. in the Public Library, when the following Papers were read :

THE CONDITION OF PREHISTORIC RACES, AS INFERRED FROM OBSERVATION OF MODERN TRIBES.

By E. B. TYLOR, Esq., V.P.

IF the development of civilisation were a uniform process, the discovery of a few objects made and used by a prehistoric tribe would be a sufficient index to determine the exact place of that tribe in civilisation. For instance, the implements and carvings of the cave-dwellers of Central France would enable us to conclude at once as to the domestic life, arts, customs, government, and religion of this old and interesting people; and even the rude flint implements of the quaternary or drift period would be an exact criterion of the general culture to which their makers had attained. To a certain extent, in fact, human culture does progress consistently; and evidence as to the condition of any one of its departments really does authorise, in some measure, an opinion as to its condition as a whole. A tribe using stone hatchets is not likely to be proficient in alphabetic writing, or in constructing machinery, or in abstruse mathematical calculation. If we were told that the Chinese, or even the ancient Egyptians, had invented an instrument on the principle of the telescope, we should easily accept the statement on reasonably strong

evidence; but a statement that the New-Zealanders or the Botocudos of Brazil had done so would be looked on as palpably absurd. Or we may take real instead of imaginary instances, from the relics of the mound-builders of North America. There were found in an altar mound in the Scioto valley ten bracelets of hammered native copper, said to correspond closely in dimensions and to weigh 4 oz. each. But it is not a justifiable inference that these were weights, for the balance has never been found in use except at a much higher level of civilisation than the mound remains indicate. So again the plans of their embanked enclosures, circles, squares, and octagons derived from squares, and the correspondence of their dimensions—as, for instance, the existence of five or six squares of 1,080 feet side—have been thought to establish ‘the existence of some standard of measurement among the ancient people, if not the possession of some means of determining angles.’ But these, too, are suppositions of culture lying beyond the average level of the mound-builders’ arts, and in fact they are not needed, for a long cord and a bundle of stakes are really all the instruments required for laying out any earthwork of the mound-builders, and for copying in new places a work already constructed.

As there is thus, within limits, a real consistency in stages of civilisation, the examination of modern tribes with a view to ascertaining how far any special point of culture is a criterion of the whole, becomes an enquiry of important bearing on the investigations to which the Congress of Prehistoric Archæology is especially devoted. I shall therefore endeavour briefly to examine how far the life of the lower modern races may fairly be taken by archæologists as a guide in reconstructing, from more fragmentary antiquarian evidence, a full picture of the condition of ancient tribes.

Among the most valuable classifications of the culture of mankind is that of the Stone, Bronze, and Iron Ages. On a very rough and general comparison, these may be taken as belonging, stone to savagery, bronze to barbarism or low civilisation, and iron to the middle level of civilisation and onwards. This ideal scale, however, requires much qualification. First, it is true that the Stone Age proper has not

been historically recorded as extending above the line of general savagery, as in modern experience the highest range of culture which a race devoid of useful metal has ever been known to reach is that of the Maoris, Caribs, Cherokees, &c. But antiquarian evidence shows that it was not always so, as in the case of the Swiss lake-dwellers, who seem to have reached during their Stone Age a settled life and a density of pastoral and agricultural population that belongs to a condition we should call barbarian rather than savage. Between the proper Stone and Metal Ages there lies an intermediate condition in which native copper was hammered cold into implements. This especially seems to have existed in North America. Such implements have been employed among the more northern savage tribes up to our own times. They were also in more extensive use among the mound-builders,* who, though they do not appear on the whole to have attained to a grade of civilisation much above that of other American tribes usually reckoned as savages, such as the Cherokees and the Apalaches of Florida, yet constructed earthworks of such enormous magnitude as could only have been the work of a dense and settled agricultural population. Secondly, the Bronze Age is a particularly good test of culture. The typical bronze-using races of modern history are the Mexicans and Peruvians, and what is known of them fits well with our dim information of the Bronze Age in ancient Europe and Asia, so as to justify the opinion that bronze always indicates a state above savagery, though at most extending to the middle range of civilisation. Thirdly, the Iron Age is wanting in the definiteness of the two other periods. Iron is, indeed, the universal accompaniment of the higher civilisation, but it also descends into the savage state. Iron-using peoples of Asia range from Persians, Hindus, and Chinese, down to the barbarous Kalmuks and Khirgis, and the savage Ostyaks; while in Africa, the Kaffir and Hottentot tribes, though iron-makers,

* Meteoric iron has been so used by the Esquimaux, but is not proved before the last century; and instruments of hammered meteoric iron are known in South Africa. The mention of iron arrow-heads among a savage South American tribe seems not sufficiently authenticated for discussion.

are in general culture below the ironless Mexicans and Peruvians, and in fact range more nearly with the savages of America. It is evident that the diffusion of the art of iron-making from civilised to savage races has gone on without a corresponding general elevation in civilisation. In Africa, indeed, there is historical information of its spreading in modern times to tribes who previously could not produce their own iron. There are found in Africa, as elsewhere, numerous tribes of a past Stone Age, and they have an especial interest here from the fact of their having been scarcely known till lately. Not only are Hottentot stone spear-heads forthcoming, but the Hottentot legends still mention the time when their ancestors used to cut down the trees with stone hatchets. In West Africa, however, the adoption of the art of iron-making happened long enough ago for its memory to have perished more thoroughly. This is well shown in a curious statement by a West African missionary, Mr. Bowen, that the well-known European and Asiatic idea of the stone hatchets found in the ground being thunderbolts is prevalent also in West Africa. 'The stones or thunderbolts,' he says, 'which Saugo the thunder-god casts down from heaven, are preserved as sacred relics—in appearance they are identical with the stone hatchets picked up in the fields of America.'* On a general survey of the Stone, Bronze, and Iron Ages, as known to us by direct experience, we may conclude as follows:—

1. The exclusive use of stone, bone, &c., for cutting and piercing implements is in general a criterion of savage culture, though compatible with the settled and comparatively advanced state of the early Swiss lake-dwellers.
2. Bronze-making indicates a more advanced and systematic civilisation up to the level of the Mexicans and Peruvians in modern, and the Aryan races in ancient times.
3. Iron-making is indispensable to high culture, but, from the facility of its adoption, is not of itself a proof of anything beyond a high savage state affected by intercourse with still higher conditions.

One of the best low level tests of races is the art of pottery, which very fairly separates the lower savage from

* Rev. T. J. Bowen, *Gram. and Diet. of Yoruba Language*. Smithsonian Contr. vol. i. p. xvi.

the upper savage and the still higher barbarian. The Australians, Fuegians, Bushmen, like the rude Crans of Brazil, were found destitute of pottery; and it is at any rate obvious, that the potter's art indicates a distinct and considerable advance upon the lowest known condition of mankind. But above this there is a tolerably wide range of culture, within which the presence or absence of pottery is of little value as a test. On the one hand, low tribes seem to adopt the art from mere contact with more civilised neighbours, as we have evidence of some North American Indians having done in comparatively modern times; and it is thus perhaps that we find even the extremely rude Botocudos of Brazil to be makers of clumsy earthen pots. On the other hand, when such intercourse with neighbours has not taken place, tribes may rise to a far higher level than this, without ever having discovered the process. Thus the Tahitians and New-Zealanders, who stand very high as savages, made no earthenware, while the much lower Papuans of New Caledonia, as well as the Fijians, were potters. It thus appears that while pottery belongs necessarily to civilised and even to barbarian culture, it is possible for savages to reach the level of the New-Zealanders without it, while its presence does not prove a condition higher than that of the Botocudos. The earthenware of the mound-builders does not prove them above the higher level of American savage tribes. The pottery of our English prehistoric races, if it is to prove anything as to their level of civilisation, can only do this by indication of skill in manufacture and ornamentation. Perhaps as interesting an issue as can be raised in this matter among prehistoric races in Europe is that of the tribes using unground stone implements. Though the men of the Scandinavian shell-heaps showed great poverty of culture by using unground stone implements, yet they made rude pottery, and we should be therefore careful not to let the absence of grinding in the stone hatchet, &c. be taken as a sign of extreme degradation. The reindeer-men of Central France, on the other hand, showed a low condition by absence of pottery as well as of ground stone implements. The lowest known tribes of men use water-vessels of wood, bark,

wicker, &c. Nor does the absence of earthenware at all prove absence of the art of boiling food. It is not impossible that the French cave people, like other tribes without pottery, may nevertheless have had pails of bark or wood, and have boiled meat in them with hot stones, as has been done among American tribes of somewhat similar habits. It may be remarked that among savages the art of earthenware-making does not include the potter's wheel, which is a civilised instrument, though tribes still in a comparatively savage state have been known to borrow it from higher neighbours. Here also I may quote a remark of M. Ed. Lartet's on the absurdity of the notion of savages ever having used pottery only baked in the sun, as, for instance, is declared to have been the case in an old account of the Canary-Islanders. Unfired pottery would wash into its pristine mud at the first touch of water. An essential condition of all pottery, savage and civilised, is that it must be fire-baked—terra cotta. But not even the rudest kiln is really necessary for this process, for both in Africa and South America the primitive practice has been observed of simply heaping fuel over the clay vessels, and baking them by merely setting fire to the heap. Fire-glazing belongs to advanced civilisation, and hardly concerns us at all here; but it may be noticed that varnishing with resin &c. is familiar to savage tribes, especially in Brazil.

In examining textile fabrics as tests of culture, several interesting points have to be raised. All human tribes twist thread or string, but there are differences in the method of manufacture. The lowest art is that of twisting the fibres by rolling between the hands or on the thigh, an art found among savages in several parts of the world, and especially remarkable in tribes at the level of the South-Sea Islanders. Next above this, I find appearing among low tribes a process which seems to indicate the manner in which the invention of the spindle took place. Thread having been wound on a stick to serve as a reel, it struck the savage artisan that, by rolling or trundling this stick on his thigh, he could twist his thread much more easily than by the hand alone. The rude South American Payaguas are observed to use this process, and even the natives of Australia have hit on the same device. Among their implements may be observed a stick

with a small cross-piece at one end, forming a reel, on which the natives wind their thread, which is made of opossum's hair, or of that of the women who are in some places cropped annually to supply material. But that this stick also answered a higher purpose than that of a reel, appears from a passage in Mr. G. F. Moore's West Australian vocabulary: 'Kumalgorang, to spin thread of women's hair, which is done by twirling a sort of cross-shaped spindle on the thigh.' It thus appears that these low Brazilian and Australian tribes have made a distinct step in advance of such tribes as the New Zealanders, who are in general at a so much higher savage level. The next stage to trundling the reel on the thigh, is to put a weight to it, and make it twirl, hanging to the thread which it is twisting; it thus becomes the ordinary spindle. Such a spindle is used with little modification by some low and many high savage tribes, and by all races above savagery, and probably most of us may have seen the savage instrument at work, in the hands of peasant women in the midst of the full civilisation of the South of France.

Spindle whorls of terracotta or stone often preserve the record of the use of the spindle among prehistoric tribes, as for example among the lake-dwellers of Switzerland; but of course the converse argument carries little proof, as the spindle may have been weighted with a piece of wood or other perishable material, as we find to have been so often the case with the spindles of the ancient Egyptians, which would have rotted away ages ago, if buried in damp ground, like the relics of most other ancient races. I cannot say whether spindle-whorls occur among the relics of the American mound-builders; but at any rate, supposing them not to be found, it is not very likely that these people should have been without an art so familiar to lower tribes at the north and south of them. The absence of spindle-whorls in the caves of Central France and the shell-heaps of Scandinavia at most raises a presumption that these rude peoples had not got beyond the hand-twisting that has characterised low tribes even in modern times.

The position of the art of weaving in the history of culture

involves even greater anomalies than these. Processes of the nature of basket-making or matting are known to all tribes of man; but even the simplest kinds of weaving are absent from the lowest levels of savage culture. Some savages, as the New Zealanders and the North-West Americans, have made a step from matting towards real weaving by the process of laying out a warp of bundles of fibre or twisted thread, and tying these together by cross threads at intervals, forming a by no means contemptible fabric which may be defined as tied-cloth. This manufacture has an especial interest to us here, from the fact that specimens from Robenhausen show that the Swiss lake-dwellers during the Stone Age habitually made it like modern savages; in fact, within our experience, it usually occurs as a process belonging to the Stone Age, whether ancient or modern. Next above this art of making tied-cloth comes the simplest kind of real weaving, which is performed by stretching a warp and threading a woof in and out. This very primitive process, which is in fact that of the Gobelin tapestry, is the plan on which weaving of considerable excellence was done by the Mexicans and Peruvians. It is beyond the art of most of the lower American races; but where we find it in use among so low a tribe as the Miranhas of Brazil, who use it in making their hammocks, we may indeed suppose that they learnt it from intercourse with higher civilisation; but we must not say that people who know this simplest weaving have necessarily reached even a high savage condition. The next improvement on this consists in shifting the alternate threads of the warp by means of leashes attached to two rods, for the passage of the woof or tram threads, or by more than two sets of leashes and rods for complex patterns. Lower races are in modern times to be seen in the transition state, gradually adopting this important device. Thus Marsden found the old plainest loom, consisting of a simple warp, where the woof was laboriously 'darned' through, in use in Sumatra, as well as the improved machine with an arrangement for shifting the warp-threads. The position, in the history of culture, of the loom thus improved, but as yet without the next addition—the thrown shuttle—has curious bearing on

prehistoric archæology. It appears from Olafsen's tour in Iceland in the last century, that weaving was then and there carried on in an upright loom, which indeed had leashes for shifting the warp, but had no real shuttle, the woof being handed through on a spindle. The Icelanders are a conservative people, and having remained till 1780 below the level attained to by old Greek and Roman weavers, may perhaps be there still. Now on the site of the prehistoric lake settlement of Robenhausen, beside specimens of tied fabrics worthy of savage art, there were also found specimens of woven linen cloth of considerable complexity; and Mr. Paur of Zurich set himself to construct the simplest loom by which these kinds of cloth could be made. It consists of two upright poles, a cross-piece from which the warp hangs down, a number of weights by which the sorted ends of the warp are fastened and stretched, four sets of rods and leashes, and a lath for passing the woof through on a bobbin. No doubt the drawing of this simple loom in Keller's 'Lake-Dwellings' fairly represents the minimum of machinery required to make the Robenhausen cloth. It will indeed probably occur to some that the simple stretched warp would be all that would be absolutely required to make all the kinds of cloth found in the lake-dwellings, and that insertion of the woof by hand might with immense labour produce the required results. But, fortunately, the clay loom-weights actually used by the lake-dwellers, and which correspond with the weights in modern use for the same purpose in the Iceland loom, remain in sets among the debris of the Swiss pile-houses, showing that in each place looms actually stood at work on the platform above. It thus appears that the loom of the Stone Age inhabitants of Switzerland was essentially the same instrument as that which has survived in modern Iceland; and this consideration may tend to diminish any sense of improbability in Dr. Keller's view of the early lake-dwellers, as being simply the ancient Celtic Swiss. I will not here discuss the philological grounds on which it has been thought that the Aryan emigration from Asia into Europe was certainly as late as the Bronze Age; but I do not by any means think it proved by absolute evidence, that early Aryan

migration into Europe may not date from the Stone Age. As to culture, the early Swiss lake-dwellers seem, by their skill in construction and the other industrial arts, and the magnitude of their settlements, to have been rather barbarians than mere savages. I need not go into details of higher developments of textile fabrics. Even the introduction of the shuttle brings us beyond the known range of prehistoric studies.

I may now enumerate briefly some miscellaneous topics belonging to the argument. If we examine a general collection of instruments of hunting, fishing, and war, it is very surprising to find, up to the middle ages, so little difference between the savage and the civilised man, except in so far as we take into consideration the use of metal instead of stone or bone. The bow and arrow extends from the savage of the South American forest to the European archer at Crecy, or the Chinese soldier of our own day; and the club, the light javelin, and the heavier spear, have a similar range. The net, the fish-hook, the fish-arrow or fish-spear, the arrow or spear with a line attached, with or without a loose head, the weir or enclosure for catching fish, the art of narcotising them by plants, the pitfall for game, are known to low levels of culture, and pass on to the higher. Thus the discovery of relics of such processes proves little or nothing to the archæologist, as to the place in civilisation occupied by the race they belonged to, though excellence of construction or ornament may serve as a valuable criterion. But there are some such instruments which drop off at an advanced stage of civilisation, so that their presence furnishes negative evidence. The spear-thrower for casting javelins is used by Australians and Esquimaux, and up to the level of Mexicans, but seems to go no higher; the poisoned arrow disappears at a moderately high level of culture; the arts of 'stone-boiling' and of making fire by friction of wood are superseded by higher processes. Imitative art furnishes a test, which is real enough but difficult of application. If we observe the artistic skill of the Polynesian and North-West American wood-carver, and of the pipe-modeller among the mound-builders, we

may find many a people far advanced above these in general civilisation, but yet falling short of their excellence in such artistic details. Thus the cleverness of the carvings of the cave-men of ancient France cannot avail much to mitigate the extreme savagery of their general condition. It is a remarkable point, indeed, to observe how, one after another, all the special tests of culture break down somewhere within the range of experience. Take another, and on the whole a valuable one, the use of hewn stone in building. At the level of the old Mexicans, Central Americans, and Peruvians, we find this art in high development, and from this semi-civilisation we follow it onward, while on the other hand it is an art unknown to low savage tribes. But the intermediate region is very uncertain. It appears in Polynesia, where the huge pyramidal marae of blocks of hewn and squared coral, described by Captain Cook, and a number of other such monuments in the South Sea Islands, show that hewing building stone is not above the possible range of savage culture. Again, we may wonder at the enormous extent of the mound-builders' embanked enclosures, such as, for instance, the Newark group in the Scioto valley, with its four miles extent; and, further west, we may admire the remarkable size and regularity of the three and four-storied houses of clay and plaster, the Casas Grandes of the Rio Gila district; yet I think we cannot put the mound-builders very high above the Cherokees and Floridans; nor need we consider the builders of the Casas Grandes to be other than the ancestors of such tribes as the present Pimas and Cocomaricopas of the district, who are still distinguished by special skill in the industrial arts. The possession of the art of writing falls almost outside our present scope. Few criteria are of more avail in distinguishing the upper from the lower civilisation; but, as a rule, the prehistoric races we are concerned with lie much below this level; and, were it not so, would probably have saved themselves from becoming prehistoric.

Of the religion of prehistoric races we have occasionally excellent evidence. The burial of wives and slaves, weapons, implements, garments, ornaments, food, with a deceased chief in a tumulus of unknown date and race, bears, no

doubt, the same meaning as the precisely similar practice among historic barbarians of Scythia, and among modern savages. It belongs to the opinion of a personal soul or ghost which survives the death of the body, and which, indeed, demonstrates its continued existence by appearing to living men in visions and dreams; the wives and slaves are killed and buried, or burned with the body of the deceased, that their ghosts may accompany and serve his as in this life.

Whether the ghost of the dead remains near the burial-place, feeds on the essence or spirit of the food, and otherwise possesses and enjoys the spirits of the offerings; whether the slaves are to be ghostly companions, and the weapons, clothes, and food are to provide the corresponding ghostly necessities for the journey to the next world; or whether the souls of the men and animals, and even of the other property, are to be continued in use after the arrival in the land of spirits, are matters of detail as to which it is not always possible to judge from the contents of a prehistoric tomb what their precise intention was. Take, for instance, the fact mentioned in Nilsson's remarkable '*Stone Age*,' lately edited by Sir John Lubbock, of the occasional finding of dogs' skulls among human skeletons in the Swedish tumuli. Nilsson reasonably enough suggests the question, whether the dog was buried there as among the Esquimaux, who put a dog's head by the tomb of a child, that the soul of the dog, which always finds its way home, may show the helpless child the road to the land of souls. He might even have added, that the ancient Mexicans also sacrificed a native dog to guide the soul of the departed over the river of death. But then dogs are also habitually buried with the dead for the general purpose of continuing in all respects in the next life their use in the present. On the whole, the best rule I can lay down as to the theoretical interpretation of remains of animals and objects found with the dead is this:—If the food, &c. are left separate from the corpse, and can be reached from outside, then they are for the haunting ghost of the departed to return to and enjoy. If they represent such a retinue of followers, and such a provision of horses, clothes,

weapons, and supplies of food as would do for an earthly journey, then they are for that spiritual journey to the land of souls which the savage considers to be like a common journey to a distant region. But the attendants and weapons that serve the dead to travel with are also partly to be used after his arrival in the next life. Especially anything like a stock of property, as, for instance, the monstrous accumulation of food, furniture, jewelry, and the like, which is sacrificed at a royal funeral in Siam, has no sense except as meaning direct transfer for use in the next world. But I believe we need have no doubt that the discovery even of weapons or ornaments in a prehistoric grave is evidence of the existence in some form or other of that Animism, or doctrine of souls, which is found strong among very low modern races, and extends upward through the whole range of religion. It may be worth while to raise here once more the question of the Aurignac cave—Does this cave really afford any evidence of the prehistoric tribes of France holding funeral feasts? The evidence from the tombs of Europe and Asia, not far back from Christian times, is often very strong as to their animistic doctrine; but it is most unfortunate that we are still so left in the dark as to the burial rites of the lake-dwellers, the men of the reindeer-caves and the shell-heaps, and the makers of the drift implements. The slightest trace of anything of the kind might give us the right to include such tribes among those holding some rude animistic religion.

So far as I can judge by examination of modern tribes, the belief in ghost-souls among a low tribe always forms part of a larger doctrine which admits the existence of other spiritual beings, considered as more or less powerful in their influence on men and circumstances, and very usually propitiated by prayers, ceremonies, and offerings. If we find proofs of a belief in a future life in the interments of prehistoric races, we need, I think, have little scruple in considering that these people also believed in spirits of the earth, the sky, the river, and the forest; but direct traces of such religion are scarce in the extreme. Our full and sincere appreciation of what prehistoric archaeology owes to our

lately deceased colleague, M. Boucher de Perthes, is not interfered with by inability to receive his view of odd-shaped flints, &c. being idols or fetishes of the drift-men. Dr. Keller's theory of the crescent-shaped terracotta objects of the Swiss lake-dwellings being connected with moon-worship, is somewhat more plausible. Putting out of the question certain crescent-shaped objects of bronze, which beyond doubt are knives, and looking at the terracotta crescents by themselves, the idea of their being objects of a lunar cultus can hardly be taken as more than an ingenious guess. Nothing that can certainly be regarded as a prehistoric idol seems to have been found; and though, to judge from experience of modern savages, objects found in prehistoric burial-places may often have been fetishes, who is to decide by mere inspection between a fetish and a mere ornament? On the whole, some of the most striking relics of prehistoric religious ceremony are perhaps the altar mounds of the mound-builders of America. We may not be able actually to match these among modern tribes, but the presence of altars on which such objects as spear-heads, or pottery, or pipes, or a mass of galena, had been burnt in great quantities of the same kind, not in the assortments of different things which are usually found in graves, goes strongly to prove them remains of sacrifice offered to deities, not offerings burnt for the dead. To judge by the sacrificial rites of several other North American tribes, there is nothing surprising in such great ceremonial rites being carried on by a race at a high savage level.

As to the general result of comparing modern tribes with the relics of those prehistoric races which have so great an interest as bearing on the antiquity of man, it seems fair to say that they furnish little proof at present of the existence of human tribes in a condition very far below that of modern savagery. Some one argued, a year or so ago, that the drift flint implements did not prove the existence of man in the quaternary period, though it must have been, at any rate, a very high anthropoid ape that made them. Probably, however, this suggestion was made under severe pressure of chronological difficulties. It would, I think, be rash to put

the prehistoric users of unground stone implements too far down on the strength of so low a state of manufacture. I have seen a modern Tasmanian flint implement for notching trees for climbing, made by clipping a flat piece of flint all round, which would have quite passed muster as a drift implement; and other specimens as rude have been preserved, though of course, till lately, the implements collected among savages have been, unluckily for our purpose, the best rather than the rudest specimens. The using of such low stone instruments is, as I have mentioned, among the shell-heap men, compatible with their being civilised enough to make earthenware vessels. The cave men of Central France, though their skulls prove them not to be of Esquimaux race, seem, by the type of their fish-arrows and other objects, to have been a good deal like Esquimaux in their habits. On the whole, Europe was no doubt inhabited in very ancient times by very low tribes; but it is hardly proved that their culture was low enough to separate them by any very broad line of demarcation from tribes which have survived up to our own times.

MR. EDWARD T. STEVENS said that Mr. Tylor had expressed himself as uncertain whether the mound-builders of Ohio had practised the art of spinning.

Fragments of charred cloth, made of spun fibres, had been found in these mounds. A specimen of such cloth, taken from a mound in Butler's Co., Ohio, is in the Blackmore Museum, Salisbury. In the same collection are some lumps of burnt clay, which had formed part of the 'altar' so called, in a mound in Ross Co., Ohio: to this clay a few charred threads are still attached.

None of the perforated stone or terracotta discs, usually regarded as spindle-whorls, have been found in the mounds of Ohio; but such negative evidence proves nothing as to the use or the non-use of weighted spindles by the mound-builders. The fly-wheel, or whorl, of the aboriginal spindle in North and Central America, as well as the spindle itself, is usually made of wood, which of course would have utterly perished, had it been placed in any burial mound.

Mr. Tylor, however, had shown that spinning could be effected with the human hand and thigh only, and without the use of apparatus of any kind.

Prof. CARL VOGT made the following remarks: 'Je ne considère pas les croissants lacustres comme des emblèmes religieux, mais plutôt comme des instruments d'un usage journalier, comme des *pince-nuque* sur lesquels on appuyait le cou pour dormir. J'appuie mon opinion en citant les épingles si nombreuses et si grandes, qui prouvent que l'on portait beaucoup de soins à la chevelure. Beaucoup de peuples sauvages ayant des tignasses ou des chignons très-forts, comme les Nouveau-Zélandais, les Abyssiniens etc., ont des machines semblables ou analogues pour ne pas déranger la chevelure en dormant, et se servent d'épingles très-longues et fortes pour se gratter la tête à travers ces coiffures souvent très-habilement arrangées.'

NOTICE OF A GROUP OF CISTS RECENTLY FOUND AT
BROOMEND, NEAR INVERURIE, ABERDEENSHIRE, AND
OF CISTS AT BISHOPMILL, NEAR ELGIN, AND AT
EDDERTON IN ROSS-SHIRE.

By JOHN STUART, ESQ., LL.D.

(*Secretary of the Society of Antiquaries of Scotland.*)

IN a paper entitled ‘Early Modes of Burial,’* I have mentioned various facts illustrative of the sepulchral usages of the early races of Scotland. One of the conclusions to which I was then led was, that no theory as to the age of a deposit could be relied on, which was based merely on the size of the cist; because, in some instances, long and short cists have been found under the same cairn, with every appearance of their having been constructed at the same time; while in long cists, and with unburned bodies, the same objects have been found as those which are ordinarily associated with short cists.

The following notes describe sepulchral arrangements, which have not been previously observed in Scotland;† and it will be remarked, that while the character of the burials at Broomend and at Bishopmill is the same in both, yet in the one case the cists contained relics of flint, while in the other there occurred a fragment of bronze.

The cists at Broomend were found in a long bank or ridge of sand and gravel. In the course of making a road an empty cist was observed, and next a cist was come to, measuring five feet three inches in length (inside), from

* Printed in the Appendix to ‘The Sculptured Stones of Scotland,’ vol. ii. p. lix.

† The cists at Broomend were discovered since the paper on ‘Early Modes of Burial’ was printed.

thirty to thirty-six inches in depth, and about thirty inches in width. The bottom of the cist was paved with water-worn pebbles to the depth of about ten inches, and on it were laid two skeletons on their sides in a bent position, their heads at either end of the cist. These were the remains of full grown men. The skeletons were covered with a piece of the hide of an ox, with portions of the hair remaining, and behind each neck an urn was placed. Several flint flakes were found; and a few pieces of charred wood, both in the cist and among the stones in the bottom, appeared.

The next cist which was found was about two feet north from the last. It measured in inside length four feet two inches, and the floor was formed of water-worn pebbles to the depth of twelve inches.

The cist contained two skeletons, one of a full grown man, the other of an infant. The large skeleton, and part of the small one, were covered with the hide of an ox. The first was lying on its side in a contracted position, and at its back was found an urn, about six and a half inches in height, much ornamented. Hanging into this urn was found a lamp made of leather, with a tag of the same material, by which it was suspended.

The infant skeleton was in the north-west corner, and was in a sitting position. Behind it a smaller urn, also ornamented with the usual patterns, was placed. Two flint flakes were found behind the shoulder of the large skeleton, and several pieces of charred wood appeared among the pebbles in the bottom of the cist.

About two feet eastwards from the cist just described, another, about sixteen inches in length, was discovered. It contained only a skull and a small urn.

At Bishopmill near Elgin, in the course of ploughing a field, in April 1864, a cist was discovered, which measured six feet in length, and three feet across at the middle, from which it tapered to each end, where the breadth was about one foot.

The skeleton had decayed, leaving a quantity of black

unctuous earth. It had been covered with an ox skin, of which portions remained with the hair on. A bronze dagger was also found in the cist.*

At Edderton in Ross-shire, under one cairn, there have been recently found six cists of small size. In one was a skeleton with an urn; in the others burnt bones, pieces of flint, and fragments of urns.†

I wish to direct attention—

(I) to the cases where great quantities of charcoal and pits filled with burnt matter have been found in connection with groups of cists containing unburnt bodies.‡

(II) To the fact that on some occasions, in large isolated urns, the fragments of bones have been found to be partly human, and partly those of sheep and other animals.§

(III) To the very numerous instances of incinerated bones throughout Scotland, occurring in stone circles, isolated cists, isolated urns, groups of cists, and groups of urns, implying a long period of the usage || in various forms of monuments.

I shall be very glad to hear (1) Whether deposits like those at Broomend and Bishopmill have been observed elsewhere? (2) Whether the occurrence of charcoal, and marks of burning, in connection with deposits of unburned bodies are common? and (3) Whether the appearance of animal bones (mixed with human ones) in urns has been remarked?

* These are noticed in 'The Sculptured Stones of Scotland,' vol. ii. Appendix to the Preface, p. xevi.

† Ibid.

‡ Appendix to the Preface, p. lxiv.

§ One at Glenelg, in Inverness-shire, found in May 1867, was found by Dr. Arthur Mitchell to contain both kinds of bones.

|| Early Modes of Burial.

STONE CIRCLES AND ALIGNMENTS.

BY JOHN STUART, ESQ., LL.D.

HAVING recently directed attention to the history and object of these monuments, in a Memoir contained in the second volume of 'The Sculptured Stones of Scotland,' I venture on the present occasion to submit a series of propositions deduced from the facts and authorities there set forth, referring for the details to the Memoir itself, a copy of which accompanies this paper.*

1. Circles of stone pillars occur in most parts of Scotland, but before the progress of agricultural improvement led to their removal, they were greatly more numerous. Groups have been noticed consisting of ten, eight, five, and four circles each.

2. Like circles are found in Ireland and in England, and they are traceable across the Continent of Europe to India, where they are also found in aggregated groups.

3. Some of the groups of stone pillars in Scandinavia appear to have been family tombs. One of these consists of eight stones, of which two have inscriptions in runes, the one later in date than the other, inasmuch as the person by whom the first stone appears to have been erected is himself commemorated on the second.

4. In Scotland some of the stone circles are surrounded by a fosse. In some cases the trench is unbroken, at others it is crossed by two approaches to the circle within. Some of the large circles in England were enclosed by a fosse and vallum, and had approaches.

5. Some stone circles in Scotland and in England have radiating lines of pillars.

* I also send a paper from Vol. I. of 'The Sculptured Stones,' which contains the details of diggings in stone circles. It is put up with the Memoir.

6. In the same way some stone cairns in Scotland have lines of pillars leading from them.

7. In the same way the lines of pillars at Carnac in Brittany form groups radiating from central sepulchral tumuli.

8. Some of the stone circles in Scotland and in England consist of double or triple lines of pillars, and the foundations of the stone cairns are frequently marked by double or triple rows of large stones in the ground, the primary deposit being in the innermost circle.

9. In the case of many circles in Scotland, the enclosed space is paved with small stones; while in others, only the surface of the innermost circle is paved.

10. Under this pavement deposits of wood, ashes, broken pottery, and incinerated human bones are frequently found.

11. In many of the stone circles of Scotland, both large and small, cists of varying size have been found, and occasionally there have been discovered close to the base of each pillar, in small cavities (at times paved with boulders), or in urns, deposits of incinerated human bones, which at times are mixed with those of small animals and birds. In many cases articles of bronze, implements of flint, and bits of deer horns have been found among the bones. Both in Scotland and in England, systematic excavations have brought to light sepulchral deposits in most of the stone circles which have been examined.

12. In some cases the bones in stone circles are unburned, but most frequently they have been burnt.

13. The same results as those specified in No. 11 have been remarked in some English circles where they have been carefully examined, and in both countries stone circles are frequently placed amid groups of sepulchral cairns and barrows. Within the circle at Stonehenge objects have been found corresponding with those in the surrounding barrows; but this great circle has never been systematically explored.

14. In some circles, both in Scotland and in England, stone chambers occur. In the great circle near Penrith ('Long Meg and her Daughters'), there were cairns at the end of the sixteenth century.

15. The theory which ascribes to stone circles the purpose of temples or courts is modern, and unsupported by facts.

16. No early author speaks of circles as temples or courts. In early records they are frequently referred to as the 'Standing Stones' (*Lapides stantes*); or, as at Stennis in Orkney, 'The Stanes;' or at Stonehenge as the 'Stanehenges.' Some of them are referred to as monuments of the dead, and at times as petrified dancers.

17. An examination of the Imperial Capitularies, the canons of early ecclesiastical councils, the Lives of Saints who laboured among pagan people, in which are frequent notices of heathen rites, fails to reveal any connection between stone circles and pagan worship.

18. From these and other sources we may gather, that the fanes and temples of the heathen were (in many cases) of an entirely different character, and were capable of being used as churches for Christian worship.

19. In the seventeenth century a theory was proposed by two English writers, John Aubrey and William Stukely, which ascribed the great circles of Stonehenge and Avebury to the Druids as their temples; and since their day all stone circles have been called 'Druidical circles.'

20. This theory rests on no authority of facts, observation, or analogy.

21. The Druids described by Cæsar and other classical writers are never mentioned in connection with stone circles.

22. These Druids were local in their occurrence, while stone circles are found throughout Europe, Africa, and Asia.

23. In Gaul, where the Druids of Cæsar were a powerful body, very few stone circles have been found; and in Armorica, where the Druidical system lingered longest, almost none, while lines of pillars are numerous.

24. The priests of the Celtic people of Ireland and Scotland are called *Druids* by their early annalists, but as described by them they are entirely different from the Gaulish Druids, being rather magicians and soothsayers.

25. The places of meeting of the Irish Druids were *hills*, on which they are said to have practised their rites, and hills continued to be places for the courts of the Celtic

people of Ireland and Scotland till comparatively recent times.

26. Two cases of courts held at stone circles in Scotland in the fourteenth century are recorded in charters of the time, but in both cases it appears from the context, that the circles were selected as prominent or well-known and central spots, and that the courts of the country were held on the moot-hills which occur in all parts of it, and on some exceptional occasions at trees, bridges, fords, or other spots, central and well known in the district.

27. In conclusion. The numerous excavations in stone circles and other groups of stone pillars already made, show an all but universal occurrence of sepulchral deposits; and I think we are entitled to infer that stone circles were monuments of the dead both from this circumstance, and relative facts previously referred to.

They may have had additional purposes; but, if so, we are entirely ignorant of them.

The greater size and importance of some stone circles afford no ground for presuming that they were different in *character* from the smaller circles, any more than we can infer that a small cairn or barrow had a different purpose from a large one.

NOTE OF ENGRAVINGS OF SCULPTURES ON STONE
MONUMENTS IN SCOTLAND.

BY JOHN STUART, ESQ., LL.D.

DRAWINGS of the sculptured stones of Scotland have been made for the Spalding Club in two volumes, the first printed in 1856, and the second in 1867. In these I have collected all the facts, historical and archæological, which seemed likely to illustrate the subject.

One result at which I arrived was, that the more remarkable of the sculptured figures were peculiar to the monuments in the north-eastern district of Scotland, a district which at one time formed the kingdom of the Picts.

These figures appear on two classes of monuments; first, on rude undressed pillars; and, second, on dressed slabs, where they are found along with crosses, and varied patterns of intricate ornamentation.

A consideration of the harmony between the style of the ornamental details of the stones and that of many Irish manuscripts of the seventh, eighth, and ninth centuries, led me to assign a date not later, and probably earlier, than these to the Scottish crosses, and to believe that the figures on the rude pillars were to be assigned to pre-Christian times.

The figures in question consist of elephants, serpents, crescents, 'spectacle ornaments,' mirrors, combs, fishes, birds, flowers, dogs' heads, bird-headed men, &c., and specimens of them are represented in the annexed woodcuts.

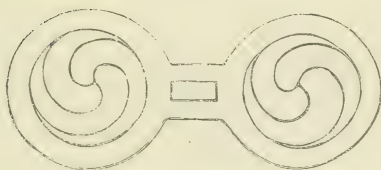
My object in now drawing attention to them is a desire to ascertain, from the present assembly of archæologists, whether stone monuments with the same sculptures, have been found in other countries?



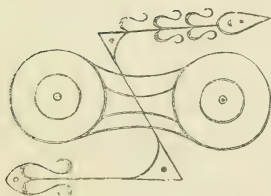
Hephæstus.



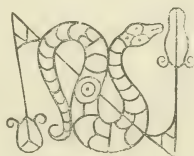
Mirror Face.



Spectacle Ornament.



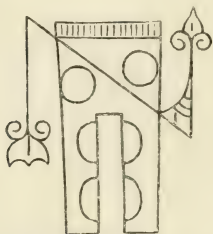
Spectacle Ornament, with Scepter.



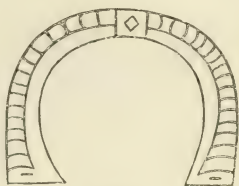
Serpent, with Scepter.



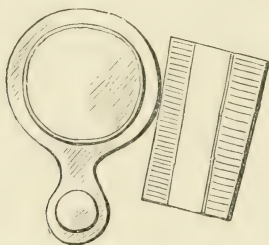
Fibula?



Oblong Monument, with Sceptre.



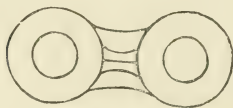
Brooch ?



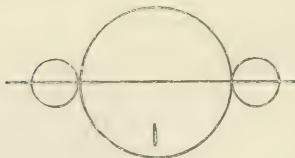
Mirror and Comb.



Crescent, with Sceptre.



Spectacle Ornament.



Fibula ?

ON CERTAIN DRUIDIC MONUMENTS IN BERKSHIRE.

BY A. L. LEWIS, Esq.

My object in this paper is to draw your attention to certain Druidic remains in the county of Berkshire. I am aware that objections are raised to the use of the word 'Druidic;' but I employ it here as a short, convenient, and universally understood term.

The two monuments which I am about to describe, are locally known as the 'Sarsden Stones' and 'Wayland's Cave.' The latter will be remembered by readers of Sir Walter Scott's novels as the scene of one of the episodes in 'Kenilworth;' and both are near the little village of Ashbury.

The 'Sarsden Stones' are about two miles south of that village, and are partly inside and partly outside Ashdown Park, the seat of the Earl of Craven; and the park wall, which is of considerable length, and appears to be built of fragments of the stones, cuts through the site lengthwise. The stones, which must have numbered several hundreds, extend over a somewhat irregular parallelogram of about five to six hundred yards N. and S., by two hundred and fifty to three hundred yards E. and W., and appear to have been from two to four yards apart. Vast numbers of them have, however, been removed; and considering the demand for stone to construct the neighbouring roads and buildings, it is a matter for congratulation that there are any left at all.*

The largest of the stones are about ten feet long, from six to nine wide, and from three to four high; but there are few so large as this, the great majority being from two to four feet in length and breadth, and from one to three feet in height; many of them being perhaps only the fragments of what were formerly large stones.

* On revisiting the spot this year (1869), after an interval of thirteen months, I found a great number of the smaller stones gone.

At first sight the stones appear to be scattered about in wild confusion and without any plan; but, on walking amongst them for a short distance, it becomes apparent that they were originally arranged in long and somewhat irregular lines. Owing to the ruinous condition of the monument, I am, however, unable to say, whether any one line can be traced as running throughout from end to end; or whether the lines do not rather run into and diverge from one another, making the plan resemble a sort of network rather than a series of parallel lines. Inside the park, the stones which were immediately in front of the house, have been cleared away, but on each side of the space thus cleared the lines reappear.

As I shall have occasion to refer further on to this system of arranging stones in lines, that arrangement is the point which I am most desirous that you should bear in mind in connection with these remains.

Unlike Stonehenge, Kit's Coty House, and other monuments of the same class, these remains are so little known that, when I visited them, I was not at all aware of their magnitude, and was consequently unprepared to take such measurements and other minute particulars as I could have wished, and as would have made this paper more worthy of your attention.

'Wayland's Cave' is situated in a plantation about two miles to the north-east of the 'Sarsden Stones,' and about one mile to the east of Ashbury. On the road between this monument and the 'Sarsden Stones' are two or three small detached stones, which may have formed part of an avenue leading to the latter. With the exception of these I saw no stones outside the parallelogram before-mentioned, the limits of which were very clearly defined.

'Wayland's Cave' consists of a gallery running nearly north and south about twenty-five feet long, two feet broad, and three feet high, which was formerly covered by three large slabs, about ten feet long and six wide, now overturned and lying by the side. Near the north end and on each side of the gallery is a chamber about five or six feet square and three high, each of which had a capstone; one of these is

upset, but the other, about eleven feet long, nine broad, and one thick, remains in its original position. The gallery itself was cut into two chambers by two of the stones which formed the walls of it being set crosswise. This monument, which it will be understood from the above description was in the form of a cross, appears to have been surrounded by a circle of small stones, four of which remain in their original position, nearly touching one another: they are about four feet long, one or two high, and one thick, and the diameter of the circle would be about fifty feet. More of these stones very likely might be found on a close inspection of the plantation by which the monument is closely surrounded. This dolmen may have been covered with earth, at all events as high as the capstones, and is still partly sunk in the ground.

About a mile to the east of this monument is an old circular or rather oval entrenchment, called Uffington Castle, and commonly, I believe, attributed to the Danes. It is situated on the top of the White Horse Hill, so called from a huge rude figure of a horse cut through the turf on the steep side of the hill into the chalk, and which is religiously preserved by the inhabitants of the neighbourhood from becoming obliterated by weeds. This figure is commonly supposed to have been cut by King Alfred to commemorate a decisive victory alleged to have been gained by him over the Danes near this place; but both this figure and the encampment may be of much earlier date. An ancient road called the Ridgeway, and acknowledged to be of British origin, runs close to Uffington Castle and Wayland's Cave, and indeed to the Sarsden Stones.

I have searched in all the books that I could procure on Berkshire for any mention of these remains, and some extracts therefrom, with a few remarks on them, will be found in the form of an appendix to this paper.

In the remains which I have described, we have fair representatives of two classes of Druidic remains:—1. A 'dolmen,' or table stone or stones, laid upon others standing in an upright position; and 2. An arrangement of stones in lines. Let us consider the objects with which the immense

labour necessarily involved in their construction was undertaken.

With respect to the dolmen (Wayland's Cave), there can, I think, be little doubt that it was used, or intended to be used, as a tomb, and not, as some would maintain, as an altar, although the surrounding circle of small stones lends in this case more confirmation to the altar theory than one always finds in dolmens. The shape and size, however, seem to me to be thoroughly adapted for a burial chamber, and not at all suitable for an altar. It is a fair argument on the part of those who think differently, to ask in this and similar cases, What has become of the earth with which the stones were covered; but it is very probable that many were only covered up to the supporters (which are generally sunk half their depth even now), leaving the capstones exposed. This would require a much smaller quantity of materials than would be necessary to cover the monument entirely; and it would be probable that any, the capstones of which were thus exposed, would be the first to be (as most of them have been) broken into and upset. We know that to rob the grave of a deceased hero was a favourite exploit of the Scandinavian pirates. It is not, however, necessary to the tomb theory, that the monument should have been covered at all, since stone kists of an analogous construction, and known to have been used as tombs, are frequently found in India without any covering.

I am not, however, disposed to assert, that *everything* in the shape of a dolmen was a sepulchral monument. The well known Kit's Coty House, for instance, I imagine to have occupied a position similar to that of the central trilithon at Stonehenge, and to have had placed before it a flat altar stone similar to that at Stonehenge (which I take to be the real form of altar used in Druidic sacrifices). It may probably have been surrounded with a circle of small upright stones, though, if so, they have long disappeared.

What, however, shall we say of the 'Sarsden Stones,' and their apparently aimless arrangement in lines?

This arrangement, to which I have already particularly directed your attention, is not peculiar to this monument, nor

to British nor even to European remains. The great monument of Carnac in *Brittany*, for instance, is formed of stones much larger than those at Ashdown Park, but arranged in lines. The *Memoirs of the Anthropological Society of London* (vol. ii.) contain an account of stones in *Shetland* of similar size to those I have described, and also arranged in lines. Some of the latter were found near some tumuli, but others had no tumuli near them; and I incline to think, therefore, that the tumuli were subsidiary to the stones—not the stones to the tumuli.

An arrangement of stones in lines in *India* is described by Colonel Forbes Leslie in his most interesting work on the ‘Early Races of Scotland.’ It consisted of three or four upright stones somewhat like paving slabs, and about four feet high, set in a *line*, behind which stood two *lines*, each consisting of thirteen stones of a similar shape but smaller. Small as this monument may seem when compared with Carnac, or the Sarsden Stones, it may serve as a key to explain the object for which they were constructed; for, only a short time before the Colonel visited it, *it had been used as a temple* in which to sacrifice to a god named Betal. The name Betal, or Vetal, itself suggests many interesting trains of enquiry, but these I must not now enter upon. It is a curious circumstance that the Colonel also found, used in the worship of the same deity, a very small circle of stones smaller than those mentioned above, and having three stones in the centre, answerable to the great trilithon at Stonehenge, and some placed outside the circle in a similar manner to the ‘Friar’s Heel’ and other stones at Stonehenge. As India is full of monuments of this kind, and as they are also found in many countries between India and Britain, I think that when we find circles of stones and lines of stones used as temples in which to offer sacrifices in India, it goes a very long way to prove that the circles and lines of stones of similar plan, though larger size, found in Gaul and Britain, were intended for the same purpose. It has indeed been generally admitted, that the British circles were intended as temples, though some have contended that they were sepulchral monuments on the ground that in-

terments have been found in some of them; but this, if admitted, proves only that our ancestors, like ourselves, buried their dead in their places of worship; a custom which we have indeed most probably derived, like many others, from them. It is difficult to believe that the vast and symmetrical monument of Avebury could only have been commemorative of the interments either of one or more generations.

I should remind you that the number of stones employed in the construction of the small circles in India, equals the number of persons or tribes engaged in the worship of the God. We can easily understand that it was formerly accounted as good and pious a work to add a stone to the lines of Carnac, as it now is to build or repair a church.

Who were the architects of these extraordinary monuments?

This question has been so much disputed, that I almost fear to touch upon it; but, for the sake of bringing on a discussion in which I am sure much valuable information must needs be elicited, I will frankly state that, in my opinion, the term *Druidic* is not only convenient but *correct*; and that these monuments must be attributed to the Celtic nations, or to those nations which have been influenced by them, so far, at least, as Europe is concerned.

It seems to me almost certain that there must have been some connection, racial or otherwise, between the peoples who have in different countries, and it may be at different periods, constructed these monuments. It is easy to understand that similar necessities might lead to the construction of rude flint implements of a similar shape, by nations which had nothing in common, and which were separated by centuries in time, and by continents and seas in space; but it is not easy to conceive any impulse or necessity that would lead a nation to arrange shapeless stones over acres of ground in a special manner similar to that used by another nation with which it had no connection whatever; nor is it quite clear why these remains, which were formerly attributed to the Romans, on the ground that the Britons were too uncivilised to have constructed them, should now be attri-

buted to some 'prehistoric' race, which, if it ever existed at all, must have been far more uncivilised than the later Gauls or Britons.

APPENDIX.

Ashmole, in his 'Antiquities of Berkshire' (8vo. London, 1723, p. 198), says,—'At Ashbury Park, in this parish, is a camp of an oblong figure, about 100 paces in diameter, and other works single, which is an evidence of its Danish origin. It is now almost destroyed by digging for the Sarsden stones to build a house for the right honourable proprietor the Lord Craven.'

Aubrey makes use of almost the same words, which are also quoted in Camden (Gough's edition, 1806); but with all due respect to these eminent antiquaries, I would suggest, that as the stones are not found under the surface but upon it, *digging* for them would, to say the least, be somewhat unnecessary.

Lysons (Rev. D. & S., F. R. S.) in their 'Magna Britannia' (London, 1813), under Berkshire say (p. 192),—'It will here be proper to mention those remarkable stones, of a fine silicious grit, called by the country people Sarsden stones, or grey wethers, which are scattered over the Berkshire and Wiltshire downs. They appear to have been removed by some violent concussion of the earth, as they evidently lie on strata to which they do not naturally belong. A great number of them are to be seen in the valley near Ashdown Park, on a stratum of chalk; others on a bed of clay in the parish of Compton Beauchamp. They are frequently blasted with gunpowder, and used for pitching, &c., but are too hard to be worked.' Murray's Guide, on I know not what authority, states that they are the remains of a tertiary stratum of Bagshot sand, indurated, with which the chalk was once overlaid.

It is not impossible that these stones may have been originally brought from a distance and scattered over the downs by floating ice during the glacial period, or in some other operation of nature; but it is quite certain that they must have been placed in their present position by human agency. No natural means could have deposited them so thickly and regularly within limits so strictly defined, and, comparatively speaking, so narrow.

There is a parish called Sarsden in Oxfordshire, about twenty miles north of this spot.

The same authors (*Lysons*, p. 215), speaking of 'Wayland's Cave,' say,—'A little way to the westward of Uffington Castle before-

mentioned, and near the Ridgeway leading over the downs, there is a considerable tumulus,* commonly called "Wayland Smith," over which are irregularly scattered several of the large stones called Sarsden stones, found in that neighbourhood, three of the largest having a fourth laid on them, in the manner of the British cromlechs. It is most probable that this tumulus is British.'

Wise (Francis, B.A., Fell. Trin. Coll. Ox.) in a 'Letter to Dr. Mead concerning Antiquities in Berkshire' (1738), quotes Aubrey as follows:—'About a mile or less from the White Horse Hill there are a great many large stones, which, though very confused, must yet be laid there on purpose. Some of them are placed edgewise, but the rest are so disorderly, that one would imagine they were tumbled out of a cart.' Mr. Wise adds—'Those that are left enclose a piece of ground of an irregular figure at present, but which formerly might have been a rude square extending duly north and south.' He considers it to have been a 'Danish burial altar,' erected as a tomb to some Dane slain in the battle alleged to have been won in the neighbourhood by King Alfred, though how he can suppose that an army decisively defeated should be able or willing to stay within two miles of the battlefield long enough to erect such a monument, I cannot understand; nor does it seem likely that the victors would have taken so much trouble about the interment of a fallen foe.

Wayland's Cave is also mentioned casually by Mr. Wright, Colonel Forbes Leslie, and other archæological authors of the present day.

Mr. E. T. STEVENS confirmed the opinion expressed by Mr. Lewis, of the non-sepulchral nature of such megalithic structures as Stonehenge and Avebury.

With regard to Avebury, so lately as in 1865, extensive excavations were made within the great circle, under the direction of the Hon. Secretaries of the Wiltshire Archæological and Nat. Hist. Society (Rev. A. C. Smith and Mr. Cunnington, F.G.S.). These excavations were made at no less than fourteen different spots, and in one case a trench, sixty feet in length, was dug, without the discovery of any human remains.

Mr. Petrie, of Kirkwall, has also stated that similar ex-

* If there exist a tumulus at all, its size is inconsiderable.

cavations were made in 1861, within the great circle known as the 'Stones of Stennis,' in Orkney, by a deputation of archaeologists from Edinburgh, with a like result—not a vestige of human sepulture was observed.

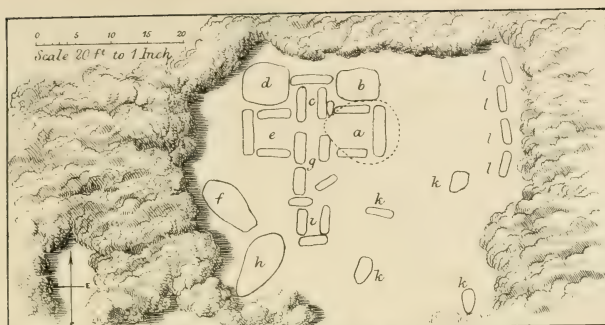
An application was made to the proprietor of Stonehenge in 1865, by the Wiltshire Archæological and Nat. Hist. Society, for permission, in accordance with the suggestion of the members of the British Association at the Bath Meeting, to excavate beneath the altar-stone at Stonehenge; but leave was not granted, and at present there is no evidence as to the sepulchral character of our great Wiltshire monument. Mr. Stevens pointed out the close resemblance which exists between many of the ancient megalithic structures and others still used for sacrificial purposes in the Dekhan of India,* which last are known to be places of worship, and not burial-places.

Sir JAMES Y. SIMPSON expressed an opinion that Stonehenge had never been used as a place of worship.

The PRESIDENT decidedly thought Stonehenge was a place that was held sacred, though perhaps not a place of worship. He thought the Druids had nothing whatever to do with the erection of those stones. The name of Stonehenge was derived from the presence of these stones already gathered together in the spot, and the words merely meant 'the place of stones;' and he therefore believed those who gave the name knew nothing of the origin of the relics. Those who made the place would have given it some more definite name, and he believed we knew nothing of the people from whom it had its origin. Within three or four miles of Stonehenge there were three or four hundred tumuli. There was no reason why there should be this extraordinary number of tumuli there, were it not that they clustered around this spot as a sacred place. In these tumuli there were found no ancient weapons of iron; two or three had been found there, but they had evidently been placed there subsequently. More than fifty of these tumuli contained, however, weapons or ornaments of bronze, and he therefore believed that

* Lieut.-Col. Forbes Leslie's 'Early Races of Scotland,' vol. ii. pp. 454-467.

Stonehenge was a monument erected during the Bronze Age. We ought to take as much pains to preserve these great monuments as Westminster Abbey, or any other great monuments of the country. He regretted that more care was not taken of the relics, and that people who went there on pleasure parties defaced them, which he thought was a disgrace to the nation.



"WAYLAND SMITHS CAVE", BERKSHIRE.

a, lateral chamber on which the Capstone (marked.....) remains.
b, capstone of gallery chamber *c*.— *d* capstone of chamber *e*
f, capstone of gallery *g*.— *h* capstone of gallery;
k, *k*, detached flat stones— *l*, *l* upright stones apparently forming
 part of a circle round the tomb

THE "SARSDEN STONES" BERKSHIRE.

Sketch Plan.

Earl Cravens

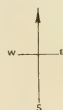


Mansion

Earl Cravens Park wall

Road from Ashbury

Hills about 200 ft high



Farm Buildings

0 100 200 300 400
 Scale 400 ft to 1 inch

A. L. Lewis del.

J. Jobbins lith.

ON ROCK CARVINGS.

BY HODDER M. WESTROPP, ESQ.

THE presence of carvings on rocks, stones, monoliths, cromlechs, and other megalithic structures in many countries, bearing a remarkable analogy and likeness to one another, has justly excited much wonder and speculation. Sir James Simpson has published a very careful and accurate account of the sculpturing of cups and concentric rings on rocks in various parts of Scotland, accompanied by excellent illustrations. Mr. Tate has published those discovered in Northumberland. M. Du Noyer has also written some interesting papers on the rock carvings found in Ireland. We have also accounts of analogous carvings in other parts of the world. In Brittany, the blocks used in the construction of the gallery and chamber of the sepulchral mound at Gavrinis, in the Morbihan, are densely covered with continuous circular, spiral, zigzag, looped, and various other types of carving. The stones of the tumuli and cromlech at Locmariaker present figures of various military weapons and arms, with some imperfect figures of animals.

Analogous carvings of circles and very rude sketches of canoes and rowers have been found on rocks and cromlechs in Scandinavia.

Rude representations of animals, with inscriptions, occur on rocks near Mount Sinai, which have been attributed to wandering pastoral tribes.

Humboldt mentions 'rocks covered with sculptured figures' in several parts of South America. He thus notices some on the Orinoco: 'We were shown, near the rock Culimacari, on the banks of the Cassiquiare, and at the port of Caycara, in the lower Orinoco, traces which were believed to be regular characters. They were, however, only misshapen figures

representing the heavenly bodies, together with tigers, crocodiles, boas, and instruments used for making the flour of cassava. It was impossible to recognise on these painted rocks (*piedras pintadas*, the name by which the natives denote those masses loaded with figures) any symmetrical arrangement, or characters with regular spaces.

Mr. Squier has discovered carved rocks at Masaya, in Nicaragua. 'These carvings,' he says, 'covered the face of the cliffs for more than a hundred yards, and consisted chiefly of rude representations of animals and men, with some ornamented and perhaps arbitrary figures, the significance of which is now unknown.' He adds that rocks inscribed in very much the same manner are scattered all over the continent, from the shores of New England to Patagonia. Most, if not all, of them are the work of savage tribes.

Mr. Bollaert describes an engraved stone found at Caldera, Western Veraguas, as a granite block, known to the country people as the '*piedra pintada*,' or painted stone. It is fifteen feet high, nearly fifty feet in circumference, and flat at the top. Every part, especially the eastern side, is covered with figures. One represents a radiant sun; it is followed by a series of heads, all with some variations, scorpions, and fantastic figures. The top and the other sides have signs of a circular and oval form crossed by lines. The sculpture is ascribed to the Dorachos, a numerous tribe, which formerly inhabited those parts. Several other monuments, tombs of the same tribe, are mentioned as being covered with fantastic figures, or representations of natural objects.

Other rocks, or *piedras pintadas*, are mentioned by the same author as representing figures of animals, branches of flowers, and other strange characters of various angles. One in particular is described, not far from Quito: 'In this solitary spot (the ravine of the sun), shaded by luxuriant vegetation, rises an insulated mass of sandstone. On the surface of the rock are concentric circles, representing the image of the sun. This rock is thus described by Humboldt: 'One of the surfaces of this small rock is remarkable for its whiteness: it is cut perpendicularly, as if it had been worked by the hand of man. On this smooth and white ground are

concentric circles, which represent the image of the sun, such as at the commencement of civilisation we see it figured among every nation of the earth. These circles are of a blackish-brown; and in the space they enclose, we perceive some lines half effaced, which indicate two eyes and a mouth. On a close examination of the rock, we discovered that the concentric circles were small veins of brown iron ore, very common in every formation of sandstone; the lines, which indicate the eyes and the mouth, are evidently traced by means of some metallic tool.*

Others are described by Mr. Bollaert in the valley of the Pintadas, at the foot of the Andes, consisting of representations of Indians, llamas, dogs, and other forms, on the side of the desert ravine, some of the figures being thirty feet or more in height, cut or rather scraped out in the sandy soil, the lines being twelve to eighteen inches broad, and six inches deep.

At one league from Macaya he observed a large isolated block, twelve feet square, called the Piedra del Leon, covered with very old Indian sculptures. The centre group consists of a man wrestling with a puma; also figures of llamas, guanacos, circles, serpents, &c. These figures are not chiselled, but picked out with some pointed instrument. He supposes it to be a very ancient Aymara work. Mr. Bollaert was informed that at Maui, to the south of Peru, there were sculptured stones with the sun, moon, and stars, Indians, and animals.

A granite rock, eight leagues north of Arequipa, Peru, presents rude representations of the human figure and of animals, with the usual circles enclosing a cross.

At the heads of Sydney Harbour, in Australia, rude and ancient figures of the kangaroo have been found sculptured on the rocks.

At the Cape, the Bushmen, one of the rudest existing

* Basalt, also, when the decomposition of the rock has not been considerable, exhibits a concentric arrangement of coats round centres at variable distances from each other. The early men, being like children, fond of imitation, may have copied these concentric circles of natural formation; hence their frequency in countries widely apart.

races of humanity, live much in caves, and frequently paint on the walls of them the animals of the neighbourhood, and sometimes battle and hunting scenes—always in profile.

In the Fifeshire caves, sculptured representations of the horse, the dog, the bear, the deer, fish, serpents, also the comb and mirror, almost identical with those found upon the sculptured stones in other parts of Scotland, have been lately discovered.

Similar caves with sculptured figures have been discovered in St. Domingo.

Even in the earliest and rudest ages man, as Sir James Simpson observes, was a ‘sculpturing and painting animal,’ and exhibited his love of imitation, when his artistic instinct was evolved. Amongst the relics found in the Périgord caves, there have been discovered sculpturings upon stone, bone, and ivory, of different animals, and latterly a rude sketch of the mammoth.

Various have been the conjectures with regard to the origin of these carvings and sculpturings, the age at which they were carved, and the race of men who carved them.

Professor Nilsson attributes those found in Scandinavia to a Phœnician origin, and considers the circles as symbols of the sun and the other heavenly bodies; a most untenable hypothesis, as there are no similar carvings among Phœnician remains with which to connect them. Besides this, analogous and identical circles and carvings are found in America and other countries where no Phœnician influence could possibly have reached.

Others suggest that they are symbols or symbolic enumerations of families and tribes, or some variety of archaic writing or philosophical emblems. But from the rudeness of their rock sculpturings, it is evident that the men who carved them must have been in a very low state of civilisation, and consequently could not have had any idea of symbolism. Symbolism belongs to a more advanced age, and to more reflective minds. Almost all of these carved figures are evidently merely representations of actual objects.

In the opinion of some authors, they are designed to commemorate events of greater or less importance; but, as Mr.

Squier remarks of the rock carvings at Masaya, they are for the most part far too rude to be of much value.

We shall, I think, be led to a more just conclusion as to their origin if we bring before our minds that man, in his rude, early, and primitive age, bears a great analogy in his thoughts and actions to a child. The savage and the primitive man have the same fondness for imitation, the same love of laborious idleness, as the child. A child will pass hours whittling and paring a stick, building a diminutive house or wall, and tracing forms on the turf. The savage will wear away years in carving his war club, and polishing his stone adze. These considerations lead me to attribute these carvings and sculptures to the laborious idleness of a pastoral people: passing the long and weary day in tending their flocks and herds, they amused themselves by carving and cutting these various figures of the sun, the moon, or any animals or objects in their neighbourhood on the rocks near them.

An interesting instance of this practice we have in the story told of the celebrated painter Giotto, who was a lowly shepherd-boy, and who, while his flocks were feeding around, passed his time in drawing on a smooth fragment of rock, with a pointed stone, the figures of his sheep. This attracted the attention of Cimabue the painter, as he was riding by.

The rude outlines of figures, faces, representations of the sun, moon, and animals (according to the country in which they are found—the mammoth among the early and primitive races; the horse, the dog, the bear, in Europe; the camel on the rocks near Mount Sinai; the llama in Peru; the kangaroo in Australia)—by primitive men, like the rude attempts at drawing by children, cannot but bear a family resemblance to one another, their utter absence of art being frequently their chief point of relationship.

These views may seem absurd, but they have the sanction of a high authority. Humboldt, when noticing the sculptured rocks in South America, considers the figures represented, instead of being symbolical, rather as the *fruits of the idleness of hunting nations*. As some are inclined to recognise alphabetic characters in these carvings, he observes ('Cordilleras,' i.

154), 'We cannot be too careful not to confound what may be the effect of chance, or *idle amusement*, with letters or syllabic characters.' Mr. Truter relates that, in the southern extremity of Africa, among the Betjuanas, he saw children busy in tracing on a rock, with some sharp instrument, characters which bore the most perfect resemblance with the P and the M of the Roman alphabet; notwithstanding which these rude tribes were perfectly ignorant of writing. An account in the 'Magasin pittoresque' of 1864, of similar carvings in the cromlechs lately discovered in the north of Africa, near Constantine, affords further confirmation of this view. 'We thought at first to have found designs or characters carved on these stones; but, after a more careful examination, we were convinced that they were lines traced by *Arab shepherds* with the point of a stone or a knife. These capricious designs imitate in general the lines of a draught-board, or of a child's game called "morel," and also those cabalistic signs forming triangles, squares, or lozenges, which we see so frequently on the amulets of the natives.'

Sir James Simpson's note at page 107 of his work also corroborates this view. 'Three years ago my friend, Dr. Arthur Mitchell, saw the herring fishermen, *in a day of idleness*, cutting circles with their knives on the face of the rock, without the operators being able to assign any reason for their work, except that others had done it before them.'

In Italy boys often trace a complicated figure, the centre of which forms a cross,* on the walls; when asked why, they can give no reason, their only purpose being evidently to kill time.

According to Mr. Squier, the valley in which the Masaya carvings are, is remarkable for its seclusion and gloom, where the rays of the sun seldom reach. It is thus apparent that the valley was used as a retreat by the rude races of that country from the fervid heat and fierce rays of the sun; and that, in their idle moments, they busied themselves in carving those rude attempts at the representation of men and animals.

* See Hobhouse: Notes to Canto iv. of 'Childe Harold.'

Several of the walls of Pompeii, and of the guardroom of the Prætorian cohort on the Palatine Hill at Rome, are covered with rude scratchings (*graffiti*) and writings; and at the present day the same fashion continues on public walls and in more retired places, all proceeding from the same spirit of idleness. The love of twiddling and of doing something in idle moments is natural to man in all ages and climes. This is as common a peculiarity of the Irishman, who cuts and hacks his stick as he tramps along the road, as of the savage Indian who, when he retreats under the shadow of a rock in the heat of the day, whiles away his time in carving fancied resemblances of human beings, of animals, and of natural objects. It is as common to the lover who, when waiting at the trysting-place, passes his time in carving his own initials, or those of his lady-love, on a tree. To repeat Sir James Simpson's observation, man is at all times 'a sculpturing and a painting animal.'

Man, indeed, is the same in all climes, and is instinctively led to do the same thing in the same way, under similar circumstances, in regions widely apart. As Humboldt remarks, 'nations of very different descent, when in a *similar uncivilised state*, having the same disposition to simplify and generalise outlines, and being impelled by inherent mental disposition, may be led to *produce similar signs and symbols*.' Hence we find identical forms in the carvings and sculpturings in countries the most remote from one another.

Identical circles with crosses within them are found carved on the cromlechs of Scandinavia; on blocks forming an interior chamber of a tumulus at Dowth, in Ireland; on the rocks near Veraguas, Panama; and on the granite rocks near Arequipa, in Peru.

These rude carvings cannot be considered as ornamentation, as their total want of symmetrical arrangement, and the absence of continuity in their repetition, preclude this.

Some of these traced figures may, however, be like the bomärke of the Scandinavians—private marks of property. The Red Indian had also his *totem*, the mark of his nation and of the individual; and the South Sea islander his peculiar *amoco*, or tattooed pattern. The mark discovered

on a rock in the island of Bressay, Zetland, by Dr. Hunt, is evidently a Scandinavian bomark. A mark on the rock of Masaya, in Nicaragua, seems to bear an analogy to this, and may be an Indian *totem*.

Of a similar kind are the Bedouin marks mentioned by Mr. Layard in his 'Nineveh and Babylon,' p. 309. 'On some fragments of basaltic rock projecting from the summit of the cone (Kowkab) were numerous rudely-cut signs, which might have been taken for ancient and unknown characters. They were the devices of the Shammar, carved there on the visit of different sheikhs. Each tribe, and, indeed, each subdivision and family, has its peculiar mark, to be placed upon their property and burnt upon their camels.'

Carving these in idle moments, as we have already said, is as natural to the savage, or rude native of Scandinavia, as to the idler of the present day, who carves his initials or monogram on a tree or bench.

Sir James Simpson has shown that most of these carvings belong to the Stone Age, which was synchronous with the pastoral phase of civilisation. Some of a ruder description may belong to an earlier age, or the hunting phase.



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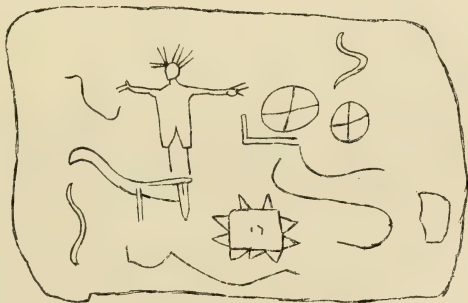
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MOORE C. R. H.

1. 2. - PIEDRA PINTAL, CALDERA, WESTERN VERAGUAS.

3. 4. - MASAYA, NICARAGUA.

5. 6. - COLUMBIA RIVER, N. AMERICA.

7. NEAR AREQUIPA, PERU.

ON CERTAIN ANTIQUITIES IN STONE FOUND IN THE
ISLANDS OF THE PACIFIC AND SOUTH SEAS.

By J. H. LAMPREY, Esq

I PROPOSE, by the title of this paper, rather to stir up inquiry than to settle a point—to inquire into the origin of the race who constructed these monuments, and endeavour to trace the principles which influenced those by whom they were erected.

Two kinds of structure have been observed—the one a rude attempt to imitate the human form in gigantic carvings, the other a modification of the pyramid formed of hand-wrought blocks of stone.

The human-shaped figures seem to be uniform in design, of both sexes, hideous in aspect, European in profile as to the face, having pendulous ears, arms a-kimbo, legs widely-flexed (where the whole figure is elaborated), the feet resting on a cube, and in general appearance resembling figures in stone found at Java, and described by Raffles, Crawford, and others; or still more like those wooden supporters to the water temples found at Dorey Point, New Guinea, and figured in the ‘Voyage of the Astrolabe,’ plate 125; such as Roggewein described in his history of the discovery of Easter Island, and subsequently mentioned by Cook, Vancouver, and others; such as now only exist in museums in Europe, or are badly figured in the works which treat of missionary enterprise. These rude attempts at human portraiture frequently rest upon square bases in three tiers, gradually increasing in size.

The second form is limited to structures resembling the bases upon which these human effigies rest, and, being of great dimensions, these are to be considered as perfect without the superimposed figure, although in some places many scores of small male and female figures were planted around and upon these truncated pyramidal structures; but,

these being of wood, were not necessarily of the same age as the stone structures beneath them. The stone blocks of which these colossal bases are formed, are of coral—coral passing into limestone—and other hard material, not always identical with the formation of the island where the structure is set up, but of materials carried over the sea from some distant rocks, where suitable stone was known to exist, and from whence it was quarried, as may be gathered from more than one of the authors subsequently quoted in this paper. These blocks seem to have been wrought with great care; the surfaces are perfectly smooth; and the joints so admirably adjusted that they have resisted the insidious attacks of time, and never fail to strike the least observant with admiration for the skill of the artificer who contrived them.

These stone remains are destitute of surface decoration or inscription of any kind, only one inscribed rock occurring in the South Seas (that at Pitcairn's Island); but there seems, nevertheless, a conclusive proof that their builders were not devoid of a certain mysticism, from the evident harmony of the arrangement of the tiers, and the constant law which seems to prevail throughout the entire series. No one, however, has made a fair measurement of the surfaces, or secured for us accurate drawings, and the canon of art to which the builders were evidently subjected has yet to be examined.

The present native inhabitants, or rather occupiers, of the islands seem to comprehend their sacred meaning, but use only the very large structures for religious purposes, while they utilise the lesser surfaces as floors for their frail dwelling-places. There can be little doubt respecting the want of all building capacity in the Polynesians dwelling in these islands at the present day; they do not seem to possess the power, intelligence, or genius to enable them to construct any such buildings; and, with one exception, mentioned by Captain Cook, they do not seem to have built anything in stone since the time of their earliest discovery by Europeans. Easter Island, examined by Roggewein* in 1720, was peopled by a race who have altogether disap-

* This island was recently visited, and several circular stone head-dresses for statues were found in a quarry of stone high up in the mountains, ready to be transported to the shore, but lying, since they were made in former times, *in situ*.

peared, and subsequent travellers have noticed an inhuman set of savages in occupation of the island, whose ears are dragged by art into pendulous forms, with a view to emulate the stone idols. The Easter Islanders can neither repair nor renew these decaying statues, which serve, as it were, to guard their coast. Other islands, also, have been swept by pestilence and depopulated in the historic period; and it is mentioned in the history of the 'Mutiny of the Bounty,' that the first-comers to Pitcairn's Island found in the graves of a race formerly existing there, large shells of a pearl oyster, not found in the surrounding sea, but common in other latitudes.

The experience derived by ethnologists who have devoted their attention to the migrations of the Polynesian races, serves to throw no light upon the builders of these structures in the Pacific; for, while many attempts have been made to trace these people to Papuan and other origins, we cannot discover in these several originals a stone-working family. That there are, in the islands now occupied by Papuans, stone remains, there can be no doubt; but there seems to be a chain of evidence that the race formerly occupying the islands in the Pacific came from the northern region of China and Thibet, if similarity in the form of stone remains existing in these countries at the present day, would serve as a clue by which to trace the direction taken by the building race.

Marsden, when speaking of the Sumatrans, says, 'In proportion as the arts in use with any people are connected with the primary demands of nature, they carry the greater likelihood of originality, because those demands must have been administered to from a period coeval with the existence of the people themselves; or, if complete originality be regarded as a visionary idea, engendered from ignorance and the obscurity of remote events, such arts must be allowed to have the fairest claims to originality at least. Arts of accommodation, and more especially of luxury, are commonly the effect of imitation, and suggested by the improvements of other nations, which have made greater advances towards civilisation.

'These afford less striking and characteristic features,

and, though they may add to the beauty, they diminish the genuineness of the work. We must not look for unequivocal generic marks, where the breed, in order to mend it, has been crossed by a foreign mixture. All the arts of primary necessity are comprehended within two distinctions: those which protect us from the inclemency of the weather and other outward accidents, and those which are employed in securing the means of subsistence. Both are essential to the continuance of life, and man is involuntarily prompted to exercise them. In climates like these of the South Seas, the impulse extends not far. The human machine is kept going with small effort in so favourable a medium. The spring of importunate necessity there soon loses its force, and consequently the wheels of invention, that depend upon it, fail to perform more than a few simple revolutions.'

In regions less mild, this original motive to industry and ingenuity carries men to greater lengths, in the application of arts to the occasions of life; and these of course, in an equal space of time, attain to greater perfection than among the inhabitants of the tropical latitudes, who find their immediate wants supplied with facility, and prefer the negative pleasures of inaction to the enjoyment of any conveniences purchased with exertion and labour.

It is greatly to be regretted, that the obstacles in the way of anything like a fair comparison of these South Sea remains, one with another, are needlessly great; and they arise from many causes, amongst which the following may be enumerated. The voyages and travels have been revised for the press by literary helpers, who were totally ignorant of the necessity of clearness of description, towards which there is evident approach in the *manuscripts* they have revised; that the slight ray of light is nearly obscured by such revision is evident, if not admitted, in such works as the 'History of the Wreck of the Antelope,' which is *composed* from the journals of Captain H. Wilson by George Keate, &c. That monuments identical with those under observation existed in the Pelew Islands, and were described as such, there is internal evidence sufficient to satisfy us, as will be shown.

Another source of confusion arises from the careless illustrations of remarkable objects, done from hearsay descriptions by artists at home, who cannot be expected to understand the purpose of their work.

Again, it arises from the indifference of the worthy missionaries, who have the best opportunity of accurately recording facts respecting the appearance, general condition, and method of working the stone under consideration, of observing the traces of tool marks on the less polished surfaces, and who might cause search to be made for the very tools employed, which perhaps remain buried in the surrounding soil.

But of all the witnesses respecting these remains, the missionaries are the least fitted to report on their condition, mainly because they consider such works as obstacles in the way of the progress of Christianity, or that, being unacquainted with the antiquity of the monuments, and deceived by the wooden idols found in their immediate neighbourhood, they confound these works with the more recent structures erected by the Portuguese and Buccaneers, who fortified their positions by building redoubts during their occupation, which exist to the present day in these seas, and of whose occupation we have authentic information. We therefore search in vain for information in recent publications respecting South Sea antiquities, and we are compelled to turn to the pages of Cook, Dalrymple, La Perouse, the '*Voyage of the Astrolabe*,' &c., for reliable information, scanty though it be; while the evident defects in the numerous illustrations to these memoirs compel us to reject such material help in a study like the present, as altogether valueless, and certain only to mislead.

In the selection of such extracts as throw some light upon the subject of this paper, I have started from the most eastern point, namely lat. 27°, long. 110°, Easter Island, towards the Marquesas and Pitcairn Island, in the south of the group; and Tahiti, Samoan Islands, Fiji Islands, New Hebrides, Caroline Islands, Pelew Islands, Ladrone Islands, towards Japan. It may be worthy of notice, that the present horse-shoe-shaped tomb of the Chinese, Japanese, and Loo

Choo islanders is found slightly modified in many places towards the south, as far as New South Wales and New Zealand, where incontestable evidence of ancient Chinese and Japanese remains are found, and are noticed in many books of travel.* But as the subject is in some degree foreign to the purpose of the inquiry proposed in the present paper, I have made no further allusion to these modern, or comparatively modern remains in such outlying regions; but only as a proof that, in ancient times, these seas may have been traversed in all directions by a race of men of high intelligence, great physical endurance, capable of patient toil in the accomplishment of great works, whose scant remains, simple as they are in form, are not destitute of that mystic rhythm in arrangement which at once entitles them to a place in the records of prehistoric times.

EASTER ISLAND, SOUTH PACIFIC,

Discovered by Jacob Roggewein, on April 6, 1721. It is 9 miles broad by 13 long, and lies from N.W. to S.E.; has a peak 1,323 feet high, lat. $27^{\circ} 5' 30''$ S., long. $109^{\circ} 46' 30''$ W. Behrens, the historian of the voyage, relates that the first native they communicated with, on being kindly treated by the ship's company, returned in his canoe towards the land, shouting the word *Odorroga!* which at first they thought meant to be addressed to some large idols which were seen placed on the shore; and the *Dort* narrative gives the following description of these idols:—'Two stones, of a size almost beyond belief, served them for gods; one was broad beyond measure, and lay on the ground; upon this stood the other stone, which was thrice the height of a man, and of such extent that seven of our people with outstretched arms would hardly have been able to encircle it. About the top of this stone was cut or carved the shape of a man's head adorned

* Freycinet, in his '*Atlas historique*,' plates 73, 74, 75, and 81. Consult Herrera, *decad.* 3, 1, 7, *et seq.*; Argensola, '*Conquista de las Molucas*,' lib. i.; Gonzales de Oviedo, '*Hist. de las Indias*;' Gomara, '*Hist. gen. de las Indias*;' '*Ultimo Viage al Estrecho de Magalhaens*,' p. 205; '*Anson's Voyage*;' '*Byron's Voyage*;' '*Wallis's Voyage*,' p. i. 279; '*Portlock's Voyage*;' Gilbert's '*Voyage of the Charlotte*,' 1788; '*Astrolabe et Zélée*;' Mortimer's '*Voyage of the Mercury*.'

with a garland, set together of inlaid work made of small stones, not ill done. The name of the largest idol was Taurico, and of the other Dago.' Captain Cook, who visited the island in March 1774, gives a more particular account of these remains. On the eastern side of the island near the sea, they met with three platforms of stone work, or rather the ruins of them; on each had stood four of these large statues, but they were all fallen down from two of them, and also one from the third. All, except one, were broken by the fall, or in some measure defaced; this one was fifteen feet long and six feet broad over the shoulders. Each statue had on its head a cylindric stone of a red colour, wrought perfectly round, fifty-two inches high and sixty-six in diameter. In some of these cylinders there was an 'upper corner taken off, in a sort of concave quarter-round.'

In a small hollow, on the highest part of the island, they met with several such cylinders as are placed on the heads of the statues. The statues were of grey stone, seemingly of the same sort as that with which the platforms were built, though some thought the stone was different from what they saw on the island; and, speculating on the difficulty of their structure, says, 'the workmanship was rude, but not bad, nor were the features of the face ill-formed, the nose and chin in particular; but the ears were long beyond proportion,' the writer goes on to say: 'But by whatever method these statues were set up, they must have occupied much time, proving the ingenuity and perseverance of the islanders in the age in which they were built; for the present inhabitants *have most certainly* had no hand in them, as they do not even repair the foundations of those which are going to decay. At this island they noticed small heaps of stones piled up, having a few white stones at top. The working tools of these people were made of bone, stone, and shells; they had no iron tools, and set but little value on them.'

George Forster, in his 'History of the Voyage of H.M.S. Resolution,' says, 'these idols have a strong affinity to the figures called *Tee* on the king's grave at Otahaitee: their weapons resembled the New Zealanders.'

MARQUESAS ISLANDS.

Melville, in his account of a four months' residence at Nukuheva, one of the Washington group, lying in the parallels of $8^{\circ} 38'$ and $9^{\circ} 32''$ south lat., and $139^{\circ} 20'$ and $140^{\circ} 10''$ west long., states that he saw, at the base of one of the mountains, and surrounded on all sides with dense groves, a series of vast terraces of stone, rising step by step for a considerable distance up the hillside. These terraces cannot be less than 100 yards in length and 20 in width. Their magnitude, however, is less striking than the immense size of the blocks composing them. Some of the stones, of an oblong shape, are from ten to fifteen feet in length and five or six feet thick; their sides are quite smooth, but though square and of pretty regular formation, bear no mark of the chisel. They are laid together without cement, and here and there show gaps between. The topmost terrace and the lower one are somewhat peculiar in their construction: they have both a quadrangular depression in the centre, leaving the rest of the terrace elevated several feet above it. In the intervals of the stones, immense trees have taken root, and their broad boughs stretching far over, and interlacing together, support a canopy almost impenetrable to the sun. Overgrowing all was a wild canopy of vines.

‘As I gazed upon this monument, doubtless the work of an extinct and forgotten race, thus buried in the green nook of an island at the ends of the earth, the existence of which was yesterday unknown, a stronger feeling of awe came over me than if I had stood musing at the mighty base of the Pyramid of Cheops. There are no inscriptions, no sculpture, no clue, by which to conjecture its history; nothing but the dumb stones.’

This writer also describes the curious massive stone foundations called by the natives *pi pis*. ‘Some of these are so extensive, and so great a degree of labour and skill must have been requisite in constructing them, that I can scarcely believe they were built by the ancestors of the *present* inhabitants. If indeed they were, the race has sadly deteriorated in their knowledge of the mechanic arts. To say nothing of

their habitual indolence, by what contrivance within the reach of so simple a people, could such enormous masses have been moved or fixed in their places? and how could they, with their rude implements, have chiselled and hammered them into shape?'

These *pi pis* foundations are so numerous, that the natives, when they shift their abode, select another of these stone platforms on which to erect their bamboo dwellings.

In Langsdorff's account of the Russian expedition of 1803-7, he states that 'The houses of Nuthahiva are built on a platform of quadrangular smoothed stones, which sometimes extends several feet in front of the house. In these buildings one cannot but be very much astonished that such people put together such immense stones. They are of a size scarcely to be moved by less than ten or twelve men, and are united without any cement, so that they are absolute Roman walls: they would indeed do honour to any European architect.'

'The place in which the sacred dances are held is in the most level part of the valley: it is paved with large, broad, flat stones, put together so close and even, that one could almost believe it to be done by a European workman. The place is seldom less than 100 fathoms long, and is tabooed.'

ASCENSION, WESTERN PACIFIC.

T. H. Hood in his notes of a cruise in H.M.S. 'Fawn' in the Western Pacific, in the year 1862, p. 174, says: 'Around the burial ground at *Moa*, I observed large slabs of a coarse red porphyry, which is brought from an island in the lagoon. This is the rock of which large blocks were conveyed in former times to Tongataboo in the great war canoes, when its chiefs or kings held this and the intermediate islands of Nian-Foo and Keppel as appendages of their kingdom.'

'This circumstance renders more accountable the existence of the ruins of ancient buildings and circles of stones, composed of materials not obtained except from distant localities, as those at Strong's or Kunaie Island, at Paadsen, Easter Island, Waiahu, &c. Now all tradition of their origin is lost,

and the natives regard them as the work of their god-like ancestors, who fished up the very islands from the depths of the ocean.'

'Amongst the most singular of these remains may be mentioned those of Ascension, or Ponapi, an island in lat. 7° north, and long. $157^{\circ} 50'$ east: they are situated upon the low land, extending out upon the flats which surround the island.

A writer in the Honolulu paper (Rev. W. Clark) visited them in 1852. He says: 'We approached the ruins from the island side by crossing a creek or canal, from twenty to thirty feet wide, walled on both sides, and nearly dry at low water. This led to the outer entrance of the ruin or fortification, which was through a large open.'

TAHITÉ.

In Walpole's 'Four Years in the Pacific,' p. 101, he relates, that in the hills above Fatawa, 'roaming about, we came upon vast squares of stones similar to the piers on which the houses are built; but they could not have been for houses up here, though the whole island bears evidence in the numerous dwellings found in the bush, of a former and much more numerous population.'

In Wilkes' expedition little notice is taken of antiquities; but in one of the Samoan group, the island of Tutulia, where La Perouse lost M. de Langle in an encounter with the natives, 'he saw several *piles of stones* under which the natives formerly buried their dead; but as M. de Langle was buried after the then custom of the inhabitants, namely, in the sand of the seashore, it may fairly be concluded that the piles of stones belonged to an ancient race who practised other customs.

HAWAII.

In Ellis's 'Missionary Tour through Hawaii, 1826,' p. 141, he says: 'We had often passed over the ruins of deserted heathen temples and the vestiges of demolished altars in the Sandwich Islands, and I had frequently visited those in other groups of the Pacific: here (in a place described below) how-

ever was a scene unique among the ruins of paganism, which we contemplated with unusual interest.

It was a compact building (*the house of Keave*), twenty-four by sixteen feet, standing on a bed of lava. The pavement was of smooth fragments of lava, laid down with considerable skill, several rudely carved male and female images of wood were placed on the outside of the enclosure; some on low pedestals under the shade of trees, others on high posts on the jutting rocks that hung over the water. A number stood at unequal distances all round; but at the south-east end was the principal assemblage on a pile of stones, neatly laid up in the form of a crescent, about three feet wide, and two feet higher than the pavement; and on this pile the images were fixed: they stood on low pedestals three or four feet high.

There were two *Puhonuas*, or cities of refuge, on the island; one at Honaunau was 715 feet in length and 404 wide, the walls 12 feet high and 15 feet thick. In it had been three large *heiaus*; the remaining one was a compact pile of stones laid in a solid mass, 126 feet by 65 feet, and 10 feet high. Many fragments of rock or pieces of lava, of $2\frac{1}{2}$ tons each or more, were seen in several parts of the wall, raised at least six feet from the ground, &c.

At p. 335 he states that the burying-place at Keauhou was a space surrounded with high stone walls, appearing very much like a *heiau* or temple; but he was tabooed from visiting it.

At p. 65 he speaks of the temple of Bukohōla, 224 feet long and 100 wide, with large stones 6 feet wide, forming a wall: on the top of the walls, 20 feet high in places, pillars to support the altar still stood; the pavement was perfect. He states that this was composed of smooth stones brought from a considerable distance, and that it had been erected thirty years before; but it can be proved that it stood there in the earliest times of the discovery of the Sandwich Islands.

At Ruapua was a *heiau*, 150 by 70 feet, built of immense blocks of lava. At the north end was a small enclosure partitioned off by a high wall with a narrow entrance.

TONGA ISLANDS, SOUTH PACIFIC.

In the account of the transactions at the Tonga Islands, given by Mr. Mariner early in 1805, he describes how the grave of a native was prepared. This is called a *Fytoca*, or burying-place, including the grave, the mound in which it is sunk, and a sort of shed over it. The grave of a chief man's family is a vault, lined with one large stone at the bottom, one at each side, one at the foot and head; is about eight feet long, six broad, and eight feet deep, covered at the top with one large stone.*

THE ISLAND OF TINIAN (LADRONE ISLANDS).

Commodore Anson, on August 26, 1742, visited the island of Tinian in long. 114° 50' W. It ranges from S.S.W. to N.N.E., is twelve miles long by six miles in breadth. 'There are, in all parts of the island, many ruins of a very particular kind. These usually consist of two rows of square pyramidal pillars, each pillar being about six feet from the next, and the distance between the rows being about twelve feet: the pillars themselves are about five feet square at the base, and about thirteen feet high; and on the top of each of them is a semi-globe, with the flat surface upwards. The whole of the pillars and semi-globe are solid, being composed of sand and stone cemented together and plaistered over.' An engraving of the ruin is given in Anson's Voyage. The island is somewhat sandy, he states, undulating and free from all bushes and underwoods; but, in a more recent French account of these remains it is stated, that the pillars are monoliths and the caps are composition, but solid and smooth.

NEW ZEALAND.

In 1839 a missionary at Wangaree found the natives cooking food in an *old bell* (?). The history given of this metal

* A megalithic structure in Tongataboo, called *Ilo Ilo Manga na Maui*, or the Burthen of Maui, has been noticed in the 'Proceedings of the Society of Antiquaries of London,' 1st series, vol. iii. p. 19; 2nd series, vol. i. p. 287; and 'Archæologia,' vol. xxxv. p. 494, where a representation of it may be found. It has also been engraved in the 'Illustrated London News' for March 10, 1860.

object was, that formerly a large tree had been blown down in a gale, and amongst the roots this bell was found, inscribed with characters like Chinese in form, but more square and regular than Chinese. It seemed to have been broken down to less than its original size, as it 'was far too shallow for its width,' and a hole, where the tongue or clapper ring had been, was stopped up by some means in order that it might be used as a cooking pot. Mr. R. Taylor, in his work on New Zealand, 1855, states that he saw this curious object.

Professor HUXLEY said he had not visited the particular islands that had been mentioned in the paper just read, but some years ago he had reason to look up the literature connected with them, and he could not say that he was impressed with any opinion of the great antiquity of these remains. There were evidences in Captain Cook's voyages and elsewhere, that the inhabitants were then building with large blocks of stone. The present race of people in Tahiti had built up a monument of the kind, and they were well able to do this, for they had stone axes, and the substance with which they built was soft rock, or coral rock, which could be had of every description of hardness. Such monuments could be made, and in Cook's time were made, by the then population. Moreover, in consequence of the peculiar nature of the population, we might understand how they would very soon forget how these monuments were made, or cease to be desirous of making them. In the small islands, the inhabitants became too numerous to be supported, and then they lost their temper and fought, and thus their resources were destroyed, and they sunk into such a condition of poverty and misery as to lead them to forget all about their monuments, or not to be able to keep them up. He did not think that any of the remains mentioned in the paper were of prehistoric origin, nor indeed of any considerable antiquity.

Dr. HOOKER, F.R.S., said, that relics of a Stone Age had been discovered in New Zealand, from which island Dr. Hector, F.L.S., had sent him chipped obsidian and other implements altogether resembling the European, and which had been found associated with the bones of the extinct

Dinornis. With respect to the bell alluded to by Mr. Lamprey as having been discovered in New Zealand, an account of it had been sent to him immediately on its discovery, and subsequently a photograph of it. The inscription on it bore so close a resemblance to the Cingalese character, that he sent it to Dr. Thwaites at Ceylon, from whom he received the following interpretation of the inscription: 'The bell of the ship Moheyedeen Vakkusa,' which signifies in Tamil that it had belonged to a Mahomedan ship. In all probability it had belonged to some ship blown out of its course, and wrecked on the shores of New Zealand.*

The discussion was continued by Mr. Campbell, Mr. Stevens, and others, all of whom corroborated the views of Professor Huxley as to the modern character of the relics mentioned in the paper.

* The bell is engraved in the 'Transactions of the Ethnological Society,' new series, vol. v. p. 159.

THIRD MEETING.

SATURDAY, AUGUST 22.

MR. E. B. TYLOR, V.P., IN THE CHAIR.

[NOTICE had been given by the Congress that there would be an excursion on Saturday to the Drift Beds of the Valley of the Little Ouse; but that, in the event of its being a wet day, there would be an ordinary meeting of the Congress at 11 A.M. In consequence of the extreme wetness of the weather the latter course had to be adopted. The Council resolved that the programme for Monday should not be interfered with, and they accordingly arranged a fresh one. In the absence of the President, E. B. Tylor, Esq., V.P., took the chair.]

MR. GEORGE BUSK, F.R.S., exhibited some stone implements from the Cape of Good Hope, and made some remarks respecting their discovery.

He stated that the larger number of the stone implements which he exhibited were sent to him by his brother, Mr. C. J. Busk, in 1867; while a smaller series had been kindly forwarded to him by Dr. Langham Dale in the present year. The latter had been accompanied by a letter from Dr. Dale, dated April 16, 1868, of which the following is an extract:—

‘I have sent you a small collection of specimens of stone implements found by me, from time to time, during the last few years, on the flats near Cape Town.

‘In the box you will find a few arrow-heads, spear-heads, and scrapers, a piece of native pottery, and one perforated stone. The flakes correspond with what is usually said of those found elsewhere, having a smooth underside, with a bulb at one end. I have also some stone cores, or nuclei, from which implements have been chipped, and a grain crusher; but these I have not put into the box; they shall be sent at a later opportunity.

‘All the implements have been found on those portions of the great flat between Table Bay and False Bay, which lie on the north side of the main road, about two miles from the shore of Table Bay. The soil is sandy, overlying a shallow stratum of iron-stone gravel, beneath which is a considerable stratum of stiff white clay, resting on hard blue stone. Wherever the iron-stone crops up, so as to be above the reach of the shifting sand, these specimens have been found. Here and there I have noticed handfuls of splinters and bits of the cores which have been used. All the specimens are rough; but the better shaped ones have usually been picked up, here and there one, as if they had been used and had fallen there. No doubt the shifting sands have buried quantities of them.

‘Various kinds of stone, not found on the flats, have been used for chipping; I think the materials were got from the adjoining beach.’

The specimens sent by Dr. Dale consisted of seventeen implements, mostly formed of quartzite with a sugary fracture, of which six are represented in the accompanying Plate (figs. 3, 5, 6, 8, 9, 10), a piece of rude black pottery, full of particles of quartz, and a perforated stone.*

The specimens collected by Mr. C. J. Busk (figs. 1, 2, 4, 7) were from the same district, but exhibited still more polish from the effect of the shifting sands. There were also cylindrical stones like pestles (fig. 11), and rubbers or pounders (fig. 12), which it has been suggested might have been used as grain crushers. As the Hottentots are not known to have ever grown grain of any kind, it would not be easy to explain the presence of so many grain crushers. One specimen might be looked upon by some as an arrow-head, but might also have been employed in tattooing. Some of the implements had a scraper form, and might have been used in dressing skins.

* The specimens collected by Dr. Langham Dale have been since presented to the Christy Collection, together with a selection of those collected by Mr. C. J. Busk: others have been added to the Blackmore Museum, Salisbury, and to the collection of Sir John Lubbock, Bart. In the Christy Collection are other specimens, presented by Mr. E. L. Layard: and some from Graham's Town, received from Sir Charles Lyell, Bart., and Mr. Charles Spence.— See also ‘*Journ. Ethn. Soc.*’ April 1869, p. 51.



Fig. 1.



Fig. 2.

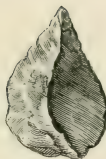


Fig. 3.



Fig. 4.



Fig. 5.

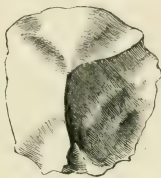


Fig. 6.



Fig. 7.



Fig. 8.



Fig. 9.



Fig. 10.

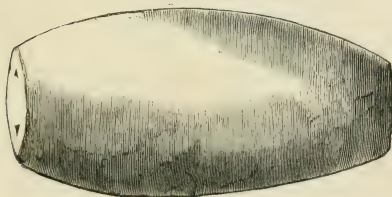


Fig. 11.

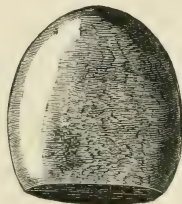


Fig. 12.

Mr. Busk had received a letter from Mr. T. Baines, the well-known African traveller, of which he gave the following extract:—

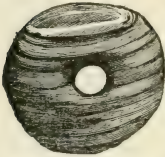
‘It may, perhaps, be interesting to you to receive the additional testimony of an eye-witness to the existence of these implements which, until recently, were not known to have been used in Africa, all the tribes that we know, or of which we have any record, having always used weapons pointed with iron or with bone.

‘It was in 1855 that I first saw spear or arrow-heads of stone, which had been dug up by Mr. Bowker, near the Fish River, in the eastern province, about eighteen feet below the surface of the soil. I saw them in the possession of Mr. Edgar L. Layard, curator of the museum in Cape Town, and he kindly gave me two, one of which is now in the museum of the Anthropological Society in London, and the other in the museum of my own native town, Kings Lynn, Norfolk.’

Mr. Busk, in conclusion, called on Mr. Evans to make some remarks on the Cape implements.

Mr. EVANS said that he had not had an opportunity of carefully examining the specimens that were on the table, but he had glanced them over, and they closely resembled other specimens he had seen from the southern extremity of Africa. Similar implements had been found as far east as Graham’s Town, and they presented precisely the same appearance. The majority of the specimens sent over by Dr. Dale appeared to be formed of quartzite, but there were others which he should imagine were jasper. They were of the simple form of a flake, struck off by a single blow from a block of flint, having one flat side and the other with two or more faces. Some of them might be mere splinters, but others were so symmetrically formed that they were no doubt intended to serve a certain purpose, such as for dart-heads or spear-heads. Some of the specimens would be used exactly in the condition in which they were when struck off from the block, the natural edges being sufficiently sharp for all purposes; but others had since been refashioned so as to

alter the edges ; and in some he noticed a curved form, and they had also been worked to a sharp edge. There was a small pierced stone in the collection, which was too small for



STONE PIERCED DISC,
(HALF LINEAR.)

a hammer or a digging stone, but it might possibly have been used in one of the methods of procuring fire by means of friction, as a fly wheel on a wooden spindle, that was made to revolve against a fixed piece of wood. With regard to the scraper to which Mr. Busk alluded, he did not regard it as one, but thought it merely an accidental form that the

flake had taken on being struck off the block. Several of the small ones appeared to have been retouched at the edge, and very possibly might have been used in some cases as arrow-heads. Generally speaking, there was a rudeness about these flakes which would lead one to suppose that they were in most cases merely the waste products of the manufacture. The crushing-stones, which were very coarse, appeared to have been used as grinding-stones, and not as pounding-stones, the sides having been worn away as if by friction. Even if they were not used for crushing grain, they might have been used for crushing certain roots which the inhabitants used. The pottery was curious, showing considerable knowledge on the part of the manufacturers of the art of making vessels to stand the fire, inasmuch as they had mixed with the clay, to prevent its shrinking, a considerable quantity of small fragments of quartz, as is so often the case in the pottery of the stone and bronze periods in this and other countries.

Mr. LAWSON TAIT drew attention to the fact that he had found weapons similar in appearance and material to those exhibited, in shell mounds on the east coast of Sutherland, on the *eleven feet beach*, which surrounds nearly the whole of Scotland in the shape of *links*. The remains were undoubtedly prehistoric, resembling in every respect those found in Denmark. It is commonly supposed that the coast of Scotland is rising at the rate of about forty inches in the century ; but it is evident that, if this is the case, such remains

must be of comparatively modern date; while, if the remains of a palæolithic age be, in this country, of the date to which they are usually ascribed, there can have been no such alteration of the relations of land and sea levels.

Mr. BUSK stated that no remains of shells had been found with the implements in South Africa, and the only things that seemed to show that the place had once been inhabited were the remains of pottery and the pounding-stones. It was possible, however, that shells might have been there, but in such loose sand they would probably have been destroyed.

Dr. INMAN alluded to a root called *nardoo*, used by the natives of Australia. The natives collected it from plants that grew in the locality, and also from the seed. It was extremely hard and somewhat difficult of digestion, and the natives in breaking it used very similar stones to those shown by Mr. Busk.

The VICE-PRESIDENT (Mr. E. B. Tylor) said, that a few years ago Africa was considered an exceptional country as regards the use of stone implements. Prichard said that the first inhabitants of Africa must have had knowledge of iron, because there was no trace of the Stone Age there. That this idea was entirely wrong they now were aware.* Although the Hottentots might not use the implements exhibited, it was probable that they might be used by the Zulu or Kaffir races. The specimen that resembled an enormous bead, and which they would suppose was the head of a digging stick, also served another purpose. The stick was made about three or four feet long, and with a gradual taper, so that the stone might be slipped along. The stick was used as a walking-stick, or staff, on ordinary occasions, and when the head was put on it served as a club. For the purposes of digging, the weight of the stone was a great assistance. If they supposed those specimens to be Zulu remains, there could be no difficulty whatever about the grain crushers, because the Zulus were known to be users of grain; and the presence of pottery was no difficulty, because it was known that they used it. The stone in the form of a ring he thought was too small to be used for obtaining fire. Savages produce fire by twirling a

* See also 'Early History of Mankind,' by E. B. Tylor, p. 219.

wooden stick against an indentation in a piece of wood below, just as the muller is worked in producing chocolate. They continue this motion until the dust in the hole is set fire to. By more improved arrangements a string is used to facilitate the motion; and a further improvement consists in putting a heavy weight on the stick, to act as a fly-wheel. He thought there was no such instance, however, of such an instrument being used by the Kaffir or Zulu tribes, who simply make fire by twirling the stick between their hands.

MR. EVANS, after expressing his concurrence with the views of the Vice-President, said that probably iron ore produced in some parts of Africa requires very little manipulation to render it fit for use. The Egyptians must have been brought into contact with the inhabitants of the interior of Africa at a very early time; yet among the early Egyptian remains no traces were found of iron instruments down to a comparatively modern period. It was not until the twelfth dynasty that any representation occurred that showed that iron was used in that part of the world. He could not help thinking that, if iron were known in the interior of Africa, the knowledge of its valuable properties must have been spread from those tribes who were acquainted with the manufacture; and that it must, unquestionably, have reached the knowledge of the Egyptians, who were so advanced in art. They had historical evidence of certain of the tribes of the interior of Africa not being acquainted with the use of iron in the time of Xerxes; as Herodotus mentions that certain Ethiopian tribes went to battle armed with lances tipped with bone, and with arrows that were tipped with stone. He thought, therefore, that Africa had passed through an earlier state of civilisation than that which was known as the Iron Age.

THE VICE-PRESIDENT remarked that the native traditions of South Africa distinctly preserve records of a period when stone implements were in actual use.

MR. WADDINGTON argued that in the primitive mode of manufacture of iron that existed in Africa, they could only obtain it from the best hæmatite ores, containing from 60 to 65 per cent. of iron. This ore would only be obtainable in

small restricted places, and it would be interesting to know if those rich ores really existed in the part where the specimens were found.

Mr. BUSK replied that where the implements were found, iron ore of great density was also found.

Mr. HOWORTH, in referring to the bone and stone-tipped instruments, said they were only used by the common soldiers, and that the picked men were armed with iron-tipped weapons; and that, at a date anterior to the time of Xerxes, they found the remains of bronze, stone, and iron implements, lying all jumbled together in a heap, as if they had been used by the same troops. From Sir Gardiner Wilkinson's observations it would appear that the only evidence of bronze and iron implements was to be found on the old paintings, where he considered those instruments that were painted blue to be made of steel, and those that were painted red to be made of copper.

Sir JAMES SIMPSON drew attention to the fact that mention is made in the Bible of chariots being made of iron.

Colonel A. LANE FOX, General Secretary, said, although there is now sufficient evidence to show, that in South Africa, as in other parts of the world, the use of stone for implements had preceded that of metal, yet it has been proved, by the records of the early navigators, that the art of smelting and fabricating iron had been known to the aborigines of that continent for a much longer time, and in a much earlier period of their development, than that of any other people who are in a corresponding stage of civilisation, and that the date of its introduction was anterior to the earliest records of the inhabitants by modern writers. Probably the earliest mention of the Kaffirs that we have is in a work by Magellan, lately translated for the Hakluyt Society by the Hon. Henry Stanley. This work, at the time of its publication by the society, was attributed by the translator to Duarte Barbosa; but he has since ascertained that it was probably the work of Magellan, who returned to Europe in the year 1512. He gives a general account of the east coast of Africa, and mentions the Kaffirs and the inhabitants of Madagascar as being armed, as they are at the present time, with

assegais having iron points, 'very large and well wrought.' Now Magellan, if he is really the author of this work (at any rate it is a work of the date mentioned), speaks of the cultivation and weaving of cotton in this country as a recent introduction by Arab traders; and as he particularly specifies all the articles of commerce introduced by them without mentioning iron, it is evident that the use of that metal by the aborigines was not derived from that source, at least to the knowledge of persons living at the time of Magellan's voyage, at the beginning of the sixteenth century.

It appears to be a very reasonable supposition, that the general use of iron in Africa may have been derived from the Egyptians. Although we have no actual evidence of such having been the case, yet the contact of the Egyptians with the Ethiopians, so frequently represented in the sculptures, is sufficient to warrant us in assuming that it may have spread from that source. But, in the absence of any direct evidence on the subject, much useful information may be obtained by comparing the details of the smelting process as practised in Africa with those prevailing amongst iron workers in other countries.

It is worthy of notice, that not only throughout all those parts of Africa where iron is worked, but also amongst the hill tribes of Central Asia and the Asiatic Islands, the double bellows of skins is used to procure a continuous blast, and is



CORRUGATED
BLADE.

worked in the same manner; and the earthen tubes for conveying the blast to the furnace are nearly identical and similarly constructed. A peculiar kind of double bellows, having a piston composed of feathers, is common to Madagascar and the Asiatic islands. Nor is this resemblance confined to the process of manufacture; the implements themselves also show a remarkable coincidence throughout these regions. As an instance of this may be mentioned the corrugated blade, the peculiarity of which consists in its being sunk upon alternate flanges, so as to produce a corrugated zigzag section. This is used alike for spear and arrow-heads, axes, and daggers, in all those parts of Africa where iron is worked, from the Kaffirs on the S.E. to

the Niger and the Gaboon. The same form may also be noticed on the little spear-points attached to the battle-axes of the Khonds of Central India. Judging by a specimen of this kind of blade in the United Service Institution, it appears to be used by some tribes in the Himalayan mountains, and nearly similar forms may be seen on weapons from Borneo. Spear-heads of precisely the same construction are frequently found in Anglo-Saxon and Frankish graves, races whom we know to have been amongst the earliest employers of iron in Europe. This peculiar form of blade when used for javelin or arrow-heads, had the effect of giving the weapon a rotatory motion, like the feathers of an arrow, and thereby increasing the accuracy of flight; and its very wide range of employment, always in association with the most primitive use of iron, is worthy of notice when considering the sources from which the iron manufacture may have been derived, and the period at which it may have superseded the use of stone.*

Then, again, the spears having a flat spud at the butt end, have an almost equally wide distribution. The spud-ended spears of Borneo and Madagascar are so identical as to be undistinguishable in form; this might be accounted for by the known admixture of races and of language that has taken place between those countries; but this particular weapon is found all across Central Africa, from east to west, amongst the Mahomedan negro races. One of these weapons from Liberia so closely resembles the winged palstab common to the Bronze period of Europe, both in its form and in the mode of fastening it to the shaft, as to suggest a similar use for that implement. These spuds appear to answer very remarkably to the description of an instrument in Deuteronomy xxiii. 13, in which the Israelites are directed to have a *paddle* at the end of their weapon, for the purpose of digging in the ground. In the travels of Denham and Clapperton and of Barth, several instances are recorded in which the spears of



IRON
SPUD.

* An Egyptian bronze arrow, or javelin head, of this form, three inches and two-tenths long, is described in 'Horæ Ferales,' page 152, Pl. VI.

the Bornouese, thus armed, are employed in digging the ground.*

All these circumstances appear to point to a remote antiquity, and to a common origin for the iron manufacture of Asia and Africa, and lead us to hope that further researches in this direction may be the means of revealing the sources from which it was derived.

That iron should have been the first metal employed in Africa may be accounted for by the fact, that throughout that continent, unlike most other parts of the world, iron is the most abundant and attractive metal, being found frequently in solid lumps on the surface of the ground. Nearly all African travellers concur in their accounts of the abundance of this metal. In the south-west, Mr. C. T. Anderson describes it as being found in great quantities, either in iron stone, or pure, in a crystallised state. Kolben mentions large flakes of iron on the surface near the Cape of Good Hope, and Livingstone gives a similar account of some parts of the country he traversed on the eastern coasts, and in the interior. Accounts from the Gaboon country describe it as being so plentiful there, and so visible to the eye, that the sand upon the seashore sparkles with it. Du Chaillu also confirms this by his description of the Fan iron-workers. In Kordofan Mr. Petherick speaks of a very rich oxide of iron found near the surface, containing from fifty-five to sixty per cent. of pure iron; and he says that the Djour tribe procure iron of the finest quality from the rocks upon the surface. Denham and Clapperton mention it near Mourzuk in kidney-shaped lumps upon the surface; and at Bilma, the capital of the Tibboos, they speak of nodules of iron ore in the red sandstone. Near Mandara they speak of iron as being the only metal found in the hills, and that in great abundance, but the Bornouese procure their best iron from the Soudan. Barth says that magnetic iron is found in the hills at Jinninau, south of Asiu, in the country of the Kelowi Tawarek, and also near Kuka. In the Mandingo country, Mungo Park mentions the ironstone found on the surface

* See also Chapman's 'Travels in the Interior of South Africa,' vol. ii. p. 102, where he mentions that the Makalakas have at one end of their spear shafts a piece of iron to dig up the roots of the *mugooliv*.

and used by the natives, and says that it is of a dull red colour with greyish spots ; and Grant, in his ‘ Walk across East Central Africa,’ says that the natives pick up a walnut-sized nodule of iron, covered with a rusty red dust, and in a short time turn it into a spear that glistens like steel. Mr. Warren Edwards, who was for some time in charge of the Niger expedition, had informed him that he has often seen the natives use the fragments of ironstone found upon the surface to support their earthen vessels over the fire in cooking, and that it had struck him that it was by this means they first discovered the smelting process.

From these accounts we see that Africa is essentially an iron-producing continent, and that the ore is found in situations that would be favourable to its having been employed by the natives in a very primitive condition of culture. To this cause also we may probably attribute the fact, that the inhabitants of Africa appear to have passed direct from the stone implements, described by Mr. Busk, to those of iron, without passing through the intermediate bronze period, which in other countries intervened between the ages of stone and iron.

Mr. Busk communicated the following extract from a letter of Don Antonio Machado, Dean of the Faculty of Sciences at Seville, dated July 29, 1868 :—

‘ If circumstances had permitted I should have hastened to join the Congress of Prehistoric Archæology, in order to aid to the utmost of my power its endeavours to learn the history of the human species ; a history far more interesting and useful than are the annals and chronologies of ancient and modern nations, which serve to convey little more than a knowledge of their passions and rivalries, their hates and their ambitions.

‘ We may conclude that the habitation of primitive man was in mountain caverns, and that it is in such situations that indications of the gradual development of his intelligence should be sought for, in order to enable us afterwards to investigate the traces of his advances at subsequent periods.

‘Spain would afford copious data towards the harmonising of the chronology of past times; but unfortunately we have but few amongst us willing to devote themselves to this important research. It would be tedious to enumerate all the numerous caverns which are to be found in Andalusia, and which are not less important than those of France and England.

‘As instances of caverns of this description, well worthy of attention, may be cited those at St. Nicolas del Puerto, where a sort of spring or small lake, about 500 metres in circumference and twelve in depth, is surrounded with a multitude of caverns lined with stalactites, and having their entrances all directed towards this piece of water: excavations in these caves would doubtless enable us to ascertain the epoch at which they were inhabited.

‘Another cavern, also well known for its vast extent and great height, is that of Santiago, situated between Cavalla and La Puebla in the triassic district near Biar. Of all these caverns I am about to publish a description.

‘Had Spain been in the condition of more fortunate nations, geologists and archæologists might have been invited to visit a country in which they would assuredly meet with abundant objects of interest.

‘I should have been glad of an opportunity of explaining these circumstances at a congress of men of science, in order to stimulate my indifferent countrymen to shake off their indolence, which may be attributed to the climate, together with the ignorance and fanaticism under which we have been weighed down for the last 300 years.

‘I should also have wished to lay before the meeting certain questions of primary importance; that is to say, if there be in London sufficient scientific liberty and so much love of truth as to render men willing to encounter illegitimate beliefs (*creencias ilegítimas*).

‘1. What is the origin of man? Is the race descended from a single pair; or did the creative force produce simultaneously numerous individuals of both sexes at different points of the globe?

‘2. Is the human species a modification of other animals,

effected in the course of incalculable ages, and due to the evolutions of the medium in which it has been created? Or is it derived from a single trunk, morphologically identical, or presenting only slight alterations?

‘3. If man has undergone slow and progressive improvement in space and time, why is it that animals have not been subjected to the same law, as regards *their* instinctive and intellectual faculties?

‘If questions such as these could be sounded at the Congress, and an approach be made towards their solution, it appears to me that this should be frankly declared in vindication of scientific truth, and in order to stem the flood of impossible and absurd notions which have invaded and perturbed the human reason. Let us study and observe.’

EARLY ANTIQUITIES IN PORTUGAL.

BY W. BOYD DAWKINS, ESQ., F.R.S.

MR. W. BOYD DAWKINS called attention to a collection of casts of human and animal remains, and of works of art, that had been forwarded by M. F. A. Pereira da Costa, of which the originals had been discovered in the explorations directed by the Geological Commission of Portugal, and described by himself,* and by M. J. L. Delgado,† in memoirs published under the auspices of the Commission.

Those particularly noticed by M. Pereira da Costa were from the Cabeço-da-Arruda, and by M. Delgado from the caverns of Cesareda, viz. the Casa-da-Moura, Lapa-furada, and Cova-da-Moura. The first of these, the Casa-da-Moura, contained deposits of two very distinct ages. The inferior rested on the stalagmite, and consisted of sand mixed with fragments of rock. It yielded fragments of charcoal, as well as one bone and many flint implements, one of the latter material resembling a scraper, another a flake, and a third an arrow-head. A human skull and lower jaw was also obtained from its deepest part, but, as the matrix was disturbed, they had probably been interred after the accumulation of the deposit. The bones and teeth indicated the presence of the following animals: the lynx, fox, brown bear, two kinds of canis, one of which was probably the dog, and the other the wolf, a species of deer, the water-vole, and the rabbit. The

* Da Existencia do Homem em Epochas remotas no valle do Tejo. Primeiro opusculo. Noticia sobre os Esqueletos humanos descobertos no Cabeço-da-Arruda. Lisboa, 1865.

† Comissão geologica de Portugal. Estudos geologicos. 'Da Existencia do Homem no nosso solo em Tempos mui remotos, provada pelo estudo das cavernas.' Primeiro opusculo. Noticia ácerca das Grutas da Cesareda. Lisboa, 1867.

remains of the latter animal were most abundant, and were for the most part broken, either by the hand of man or by the teeth of the carnivores which were found in the cave. None of the carnivorous bones had been subjected to the action of fire, nor did they exhibit any traces of gnawing. The bones, charcoal, and flint implements indicate that the cave was inhabited by man during the accumulation of this lower stratum.

The upper deposit is composed of a sandy loam, containing a large quantity of stones and a vast number of objects fabricated by man, such as hatchets of polished stone of the Celtic type; flakes and other instruments, of flint, bone, and antler; many fragments of black pottery coarsely made and containing bits of calcareous spar; splinters of flint; small fragments of hatchets and of plates of schist with designs, which perhaps may have been used as amulets. There were also many shells of *Helix nemoralis* and cockles, some of which were pierced for suspension. Fragments of charcoal were scattered throughout the matrix, and adhered in small patches to some of the pottery and to the pebbles which had been probably used in constructing fire-places. In the lowest portion of the deposit a bronze arrow-head was buried. The most abundant remains were those of man; they were to be counted by thousands, and all in a condition more or less fragmentary, and so scattered that it was impossible to construct one perfect skeleton out of them. Some bones were far more abundant than others; but the teeth, which for the most part belonged to young or fully grown adults, were particularly abundant. The long bones had lost, for the most part, their articular ends, and presented longitudinal fractures, and some of them had been cut and scraped. The spongy bones, such as the vertebræ and ribs, were very rare. Their condition seems to indicate that the men to whom they belonged had been eaten for food. The pottery bore ornaments of continuous lines or of rows of dots. The associated animals consisted of the bat, dormouse, rabbit, horse, a small ox allied to *Bos longifrons*, the sheep or goat, and the wild cat. The wolf, fox, and dog were also found. The presence of the latter animal would fully account for the

absence of the spongy human bones, and for the marks of gnawing on some of the humeri and femora. It seems probable that the cave was inhabited by a race of cannibals during the accumulation of the upper deposit. The evidence that human flesh formed their principal food is precisely of the same nature as that by which the Flint folk of Perigord are proved to have subsisted on the reindeer.

The contents of the other two caves were exactly of the same nature as those in the Casa da Moura, and had been accumulated under the same conditions. What then is their age? An appeal to the associated mammals relegates them at once to the series of deposits characterised by the presence of *Bos longifrons*, *Canis familiaris*, and *Ovis* or *Capra*; or, in other words, to that indefinite Prehistoric period that extends from the dawn of history in Western Europe back to the postglacial epoch. If we look, on the other hand, to the implements, we do not obtain more precise knowledge of their exact horizon. The upper or more recent of the two deposits may, perhaps, be classed with the age of Bronze, the lower one possibly with the second stage of the 'Older Stone Age' (*Worsaae*)—the Kjökken-möddings and Coast Finds.

Mr. BUSK remarked that he had had an opportunity, on a previous occasion, of examining some of the casts of bones and implements from Portugal now exhibited, and that a notice of them had been given at the meeting of the Ethnological Society during its last session, by Mr. John Evans and himself.* On the present occasion, therefore, he could merely advert to one point, upon which M. Delgado had laid considerable stress, viz. a peculiarity in the mode in which the teeth in the lower jaw were worn, and which was attributed by M. Delgado to the habit of wearing a hard object of some kind through the cheeks, as some savage nations of the present day are described as carrying. Mr. Busk, however, was not satisfied that the jaws in question presented any such marked peculiarity beyond that common to nearly all prisæan remains, viz. the flattened crosure of the crowns of

* Transactions Ethn. Soc., new series, vol. vii. pp. 39, 45.

the teeth, as to justify M. Delgado's supposition. He was indisposed, therefore, to agree with M. Delgado on the point in question any more than with respect to the value of the evidence upon which that gentleman relied in support of the notion that the ancient people whose remains he had described were anthropophagous.

With regard to the existence of ossiferous caverns in other parts of the Peninsula, containing human remains of the Stone period, Mr. Busk remarked that the late Don Casiano de Prado had pointed out the existence of numerous, as yet unexplored caverns in all parts of Spain, and had especially adverted to their abundance in Andalusia, he himself having been acquainted with the sites of twenty-five in the neighbourhood of Malaga alone. Whilst M. Machado, in a letter which had been already communicated to the Congress, noticed the occurrence of similar caverns in the vicinity of Seville, and had expressed the opinion, in which all would concur, that the exploration of these caverns, if it were possible to be carried out, promised results of the highest interest. Mr. Busk would merely, in relation to this subject, again mention the extensive and numerous caverns containing human remains belonging to a polished Stone period, discovered and explored by Captain Brome in the Rock of Gibraltar. He was also desirous of adverting to the occurrence in all parts of the Peninsula, where the contents of caverns of the kind in question had been examined—of polished implements of fibrolite; and observed that it was interesting to find that the same material had been employed by the priscan inhabitants of Portugal as well as by those of Spain.

Mr. HOWORTH remarked on the ignorance we were in as to the immense number of the prehistoric remains of Spain and Portugal, and hoped some English archæologist might go out and examine the country.

Mr. EVANS said that the stone amulet, of which a cast was exhibited, was perhaps the most curious of all the objects, as it bore the ornamentation peculiar to the Bronze period rather than to the Stone. The alternate triangles and zig-zag ladders and other ornaments are usually found on implements

of bronze. He was not aware until he saw and described these specimens for the Ethnological Society in February last, that fibrolite was used in Portugal as a material for stone hatchets.

Mr. DAWKINS expressed his satisfaction at the discussion which had taken place, and said that the evidence in favour of the human bones found in the Casa-da-Moura having been the relics of a feast of cannibals, was precisely of the same nature as that furnished by the broken fragments of reindeer bone in the caves of the Dordogne, in proof of those animals having been used for food, and is analogous to that by which Messrs. Laing and Huxley have inferred the former existence of cannibals in Caithness.

The following is a letter from M. Pereira da Costa to Sir John Lubbock, President, announcing the transmission of the collection of casts :—

‘ Lisboa, 26 de Julho de 1868.

‘Tenho a honra de accusar a recepção da carta em que V. Ex^a me participou a honrosa nomeação, que de mim se fez, para membro correspondente do Congresso internacional de anthropologia e archeologia prehistoricas na sessão que ha de celebrar-se em Londres no proximo mes de agosto.

‘As condições especiaes, em que me achava, por ter sido dissolvida a Commissão Geologica, de que era membro director, privando-me de todos os meios de poder satisfazer ao honroso encargo de membro correspondente do Congresso, foram causa para que eu não respondesse logo, agradecendo a nomeação.

‘Como as circumstancias mudaram, e pude obter do Governo auctorisação para mandar executar algumas moldagens e aproveitar das que estavam feitas, tractei, no pouco tempo que restava, de apromptar a pressa tudo que pude colligir, e remetto ao Ex^{mo} Secretario uma caixa contendo as moldagens feitas.

‘Alem dos objectos que V. Ex^a conhece, por intermedio de Sir Ch. Lyell, e dos quaes mando uma collecção para ser presente ao Congresso, vão outros que me parece que teem algum interesse. São dous martellos de pedra, achados nos entulhos d’antigos trabalhos da mina de cobre de Ruy

Gomes no Alemtejo. Estes instrumentos são semelhantes aos martellos de pedra encontrados em Hespanha nas minas del Milagro e de Cerro Muriano, e as condições são exactamente semelhantes. Os martellos existiam nos entulhos de uma escavação oblonga, a tres metros de profundidade, e eram 5; alem desta escavação, que é o trabalho mais antigo da mina, ha um poço com uma pequena galeria no fundo a 1 metro, onde se achou uma moeda romana de Claudius, alguns fragmentos de lampadas, e pequenas cunhas d'aço. Parece haver aqui uma estação prehistorica e outra romana como em Cerro Muriano.

‘Vae tambem uma peça d'ardosia, que foi encontrada em uma sepultura do sitio denominado Martin Affonso, ao pé de Muge, a qual parece ser um Phallus: é notavel pela forma, e pelos desenhos que cobrem uma das suas faces, inteiramente semelhantes aos que V. Ex^a conhece sobre as placas de ardossia, de que enviei moldagens a Sir Ch. Lyell. Esta peça estava quebrada, e os dois fragmentos sobrepostos e crusados; com ella havia na mesma sepultura alem do esqueleto, do qual apenas se aproveitaram alguns pedaços dos ossos longos, varios objectos taes como facas de silex (2 moldados), uma lança, e varios vasos de barro das formas de que envio tambem moldagens.

‘Com os martellos de Ruy Gomes não se acharam restos humanos, e por isso não é possivel reconhecer a raça que os empregou, mas tendo obtido uma maxilla inferior achada nos entulhos da mina de Alcalá no Alemtejo, tambem mina de cobre, pareceu-me conveniente enviar uma moldagem desta peça que me parece notavel, pela sua pequenez, pelas particularidades da forma, e mais que tudo pela alteração pathologica, que apresenta. V. Ex^a dará a esta peça a importancia que tiver, se por ventura tiver alguma.

‘Escrevo em portuguez, seguindo a recommendação de Sir Ch. Lyell, julgando que V. Ex^a terá a mesma facilidade para a versão desta carta em inglez. Sou, etc.,

‘FRANCISCO ANTONIO PEREIRA DA COSTA,

‘Lente da Escola Polytechnica de Lisboa.’

It will be seen that in this letter M. Pereira da Costa states that, in addition to a set of casts similar to those forwarded previously to Sir Charles Lyell,* he has added a few other objects of interest. Two stone hammers have been found in the old works of the copper mine at Ruy Gomes, at Alemtejo.† They are like those found in Spain, in the mines of Milagro and Cerro Muriano, and discovered under the same conditions; five of them were found in an oblong excavation at a depth of three metres. Besides this excavation, which forms the oldest part of the works, there is a small gallery, nine metres deep, in which a Roman coin of Claudius, a few fragments of lamps, &c., were found. There seems to be here a prehistoric station, and subsequent Roman one, as at Cerro Muriano.

A piece of slate, of which there is a cast, was met with in a grave at Martin Alfonso, near Muge, appears to be a 'Phallus.' It is curious from its form and the designs covering one of its two faces, like those of which casts were sent to Sir C. Lyell. This piece was broken, and the two fragments found placed across each other. Besides the skeleton, of which only a few long bones remained, there were in the grave flint knives, a spearhead, and a few pots.

No human remains having been found with the two hammers, it is impossible to determine the race which used them; but he has obtained an under-jaw bone found in the mine of Alcala in Alemtejo, of which a cast is sent. It is remarkable from its smallness and peculiarity of form.

It may be added that M. Pereira da Costa transmitted to the Congress, for distribution among those especially interested in the subject, a number of copies of a memoir on the dolmens of Portugal, entitled '*Descrição de alguns Dolmens ou Antas de Portugal.* 4º, Lisboa, 1868.'

* Trans. Ethn. Soc., new series, vol. vii. p. 39.

† See a notice by M. Pereira da Costa in '*Journal de Sciencias mathematicas, physicas e naturaes*, No. V. Lisboa, 1868.'

FLINT FLAKES AND MAMMALIAN REMAINS IN THE SUBMERGED FOREST OF BARNSTAPLE, IN NORTH DEVON.

MR. ELLIS then brought before the notice of Congress his discovery of flint flakes and mammalian remains in the submerged forest of Barnstaple, in North Devon. He pointed out on a diagram the position of the spot where he made the discovery. The sea had been gradually encroaching and washing inland, thus extending the beach. About 300 yards from the pebble beach, on some patches of peat which were only occasionally exposed to view, he found a few flints, and, at the depth of six to eighteen inches, he found thousands of like character, comprising flint flakes, flint cores, bones, teeth, oyster shells, &c., covering a space of several square yards. When a very severe storm took place, the trunks of large trees are observed underneath the surface. He would be happy to hear any remarks with reference to this matter.

The Rev. R. KIRWAN bore testimony to the above statement, and said that he discovered the stakes shown on the diagram. They were of oak, and he followed them to about three feet below the surface, and then desisted, in consequence of not being used to the labour. He found a layer of sand three or four inches thick; then a layer of peat, about twelve inches thick, and containing particles of shell, but very few bones; and under that was a deposit of blue mud.

Mr. BUSK said, that amongst the specimens were some bones of the ox, stag, and reindeer. Most of them were broken, and he supposed it was for the marrow.

Mr. EVANS remarked on the interesting nature of the accumulations, the relics of which were displayed upon the table, consisting of the remains of various edible mollusca, and numerous weapons for the chase and other pursuits, which had been in use amongst the people who consumed

the shell fish, and who probably lived at a remote period. The mounds, called *kjökken-möddings* in Denmark, in which similar remains were found, and which were also formed of similar accumulations of the refuse from food, belonged no doubt to the Stone Age, and possibly to a comparatively early period in it. Some of these kitchen heaps in Devonshire occurred on ground which at the present time was between high and low-water-mark, and does not seem to have been well adapted for human habitations; but this might be accounted for by supposing that there had been a subsidence of the land. The Danish *kjökken-möddings*, though as a rule found in close proximity to the sea, were placed on slight eminences.

Mr. INMAN described the appearance of a submerged piece of ground, which had formerly been a *kjökken-mödding*, the two sides resting on what geologists would call a 'fault.' There was a rock projecting on either side, but when he bored down fifty or sixty yards there was no rock whatever to be found, and the materials which were brought up were alternately blue clay, sand, gravel, clay, sand again, and then clay; and then it appeared to be probable that the water coming from the high lands above gradually washed the sand into the sea, and as that process was going on the clay gradually subsided. It had subsided to such a degree that where there was once a large forest it was necessary to have a bank to preserve the land, and the same subsidence was going on now. It was very probable, therefore, that the things which are now found under water were years ago situated some distance from it.

The discussion was continued by Mr. MOGGRIDGE and M. WALDEMAR SCHMIDT. Mr. A. WADDINGTON also addressed the meeting on the subject, stating that he had had frequent opportunities of making observations with reference to mounds on the British coast of North America, and on raking them up he had found shells and implements. Some of those mounds were about a hundred yards high, and half as wide as the lecture-room, and were used by the Indians as places from whence they could observe the surrounding country, and mark the appearance of an enemy. Many of the implements from

Barnstaple were similar to those at present in use among the American Indians and in Africa.

Mr. W. BOYD DAWKINS described a section through the alluvium on the banks of the Parrett, near Bridgwater, in which an ancient forest grew below high-water-mark, and became covered up by silt, without the intervention of any change of level. It was a parallel case to that under consideration.

Mr. ELLIS said it was generally well known in the North of Devon that the sea was encroaching, and it was only by adopting artificial means that the inhabitants could ever hope to save the land, which was being rapidly washed away.

FOURTH MEETING.

MONDAY, AUGUST 24.

SIR JOHN LUBBOCK, BART., F.R.S., PRESIDENT, IN THE CHAIR.

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The Meeting opened at Noon, when the following Papers were read :

## ON THE DISTRIBUTION OF THE RACES OF MANKIND, AND ITS BEARING ON THE ANTIQUITY OF MAN.

BY PROFESSOR HUXLEY, F.R.S.

IN employing the term 'race,' I do not wish to prejudge any question which may be in dispute touching the value of the great divisions of mankind. I use the term merely as a convenient one, and if there be any who prefer to name what I call 'races,' 'species,' I raise no objection, as far as the objects of the present paper are concerned, to their so doing.

By races I mean simply the great distinguishable groups of mankind—such groups as a naturalist would form, if all mankind were put before him to be sorted according to their physical likenesses and unlikenesses. And by distinct races I mean those which do not grade into one another, except under such circumstances as make it certain, or at any rate highly probable, that interbreeding has taken place.

The number of distinct races, in this sense, appears to me to be but small; indeed, I do not see my way to the recognition of more than four, which I shall term the *Australioid*, the *Negroid*, the *Mongoloid*, and the *Xanthochroic* races.

The characteristics of the *Australioid* race are, a dark complexion, ranging through various shades of light and dark chocolate colour; dark or black eyes; the hair of the scalp

black, neither coarse and lank, nor crisp and woolly, but soft, silky, and wavy; the skull always belonging to the dolichocephalic group, or having a cephalic index of less than 0·8.

Under the head of the *Negroid* race I include those people who have dark skins varying from yellowish-brown to what is usually called black; dark or black eyes; dark or black hair, which is crisp, or what is commonly called woolly, in texture. With very rare exceptions, these people are dolichocephalic.

In the *Mongoloid* race the complexion ranges from brownish-yellow to olive; the eyes are dark, usually black; the hair of the scalp black, coarse, straight, and long, that of the body remarkably scanty. The proportions of the skull, so constant in the two preceding races, vary in this from extreme dolichocephaly to extreme brachycephaly.

Finally, in the *Xanthochroic* race, the complexion is very fair; the eyes are blue or grey; the hair yellow or yellowish-brown. In this race, again, the skull ranges through the whole scale of its varieties of proportion, from extreme breadth to extreme length.

These appear to me to be the great primary races or stocks of mankind, and all other forms which can be mentioned seem to lie between some two of these four.

Now the geographical distribution of these four primary races is extremely remarkable.

The great continent of Australia is the head-quarters of the Australioid race. From one end to the other of that vast region of the earth's surface, this form of mankind is met with, and no other.

But the aborigines of Tasmania are well known to have had very different characters, nor do we meet with Australioid people either to the east, or to the north, of Australia, nor have any been met with in the islands north-west of Australia, or on the mainland of Asia as far as Hindostan. But the Dekkan, which is so remarkably isolated on the north by the valleys of the Ganges and Indus, beyond these by the Himalaya mountains, and on the east and west by the sea, was originally inhabited, and is still largely peopled, by men who completely come under the definition of the Australioid race given above.

The so-called 'coolies' who come over in East Indian ships are like Australians, and resemble no other people; and I have seen photographs of some of the hill tribes which could hardly have been distinguished from portraits of Australians.

Beyond the Dekkan (in which, at the present time, the primitive Australioid stock has undergone considerable intermixture with an invading Aryanised population), in Persia and Arabia, I am not aware that anything which completely answers to the definition of an Australioid can be found. But in Abyssinia and in Egypt there is a smooth-haired, dark-complexioned, long-headed stock, which I believe to have nothing to do with Negroes, and which I am strongly inclined to regard as a westward extension of the Australioid race.

Nay, more, I would venture to suggest that the dark whites (*Melanochroi*, as I have proposed to term them) who stretch from Northern Hindostan through Western Asia, skirt both shores of the Mediterranean, and extend through Western Europe to Ireland, may have had their origin in a prolongation of the Australioid race, which has become modified by selection or intermixture.

The Negroid race has its head-quarters on the opposite side of the Indian Ocean to Australia—namely, in Africa, south of the Sahara, where Negroes have existed for all time of which we have any record, while north of the Sahara they are immigrants of comparatively modern days.

There are two very distinct modifications of the Negroid type in Africa—the dwarfish, comparatively light-complexioned Bushman stock, in which the females are so remarkably distinguished by steatopygy and other peculiarities; and the taller, darker Negro proper.

Nowhere north or west of Ultra-Saharal Africa is a Negroid to be found; nor is there certain evidence that Negroids exist, or have existed, in Arabia, Persia, Hindostan, or any part of Asia, except the Andaman Islands and the Peninsula of Malacca. Here a Negroid stock, different in some respects from the African Negroes, and hence termed *Negritos*, reappears; it shows itself again in the Philippines, and, beyond 'Wallace's line' in the eastern part of the Malay

Archipelago, becomes the predominant population, until in New Guinea and the great chain of islands which extends thence under the name of Louisiade, New Hebrides, Solomon's Islands, New Caledonia, and the Feejees, it is the fundamental and aboriginal form of man. In the south, the last point at which a Negrito population is met with is Tasmania.

The Mongoloid race is most typically exhibited in Central Asia, and thence extends continuously, or nearly so, to Lapland and the Arctic circle on the north-west and north; to Northern Hindostan on the south; to the Malay Archipelago, on the south-east; on the east to China, and thence over the whole of the Pacific islands (except those occupied by Negritos); on the extreme north-east to America, and thence through the whole length and breadth of that great continent.

In speaking of the people who occupy this prodigious area as of one race, all I mean to imply is that, so far as I know, no sharp lines of demarcation can be drawn among them; the extreme terms—such, for example, as the Mongols and the New-Zealanders, or the Siamese and the Indians of Eastern North America, or the Patagonians and the Esquimaux, being connected by innumerable transitional forms.

The *Xanthochroi* inhabit a far smaller area of the earth's surface than the Mongoloids. Their head-quarters are in Central Europe, whence they extend into Scandinavia and the British Islands, on the north and west; while, on the north-east, they seem at one time, if not now, to have extended their wanderings over the great plains of Northern Asia to the frontiers of China. Southwards, they are traceable into Syria, and, in a fragmentary fashion, through Northern Africa to the islands off its western coast; while, eastward, they occur as far as Northern Hindostan.

It will be observed that, granting the existence of the Xanthochroic race in its head-quarters, there is no difficulty in understanding its distribution, as the area of this race is either one continuous mass of land, or embraces islands situated at very short distances from the mainland.

Again; admitting the primitive existence of Mongoloids in South America or in Central Asia, there is nothing to prevent



them from migrating from the one locality to the other by Behring's Strait and the chain of the Aleutian Islands.

Nor does the distribution of the Mongoloids over the islands of the Pacific present any real difficulty, as the means of navigation which they possess are amply sufficient to have borne them safely through the long voluntary and involuntary migrations, which there is abundant independent evidence to show they have performed.

But it is otherwise with the Australioid and Negroid races. Where the Australian has not come into contact with other races, his only means of navigation is a raft, or a rude and fragile bark canoe. It seems incredible that if he ever possessed a better kind of boat, he should have forgotten the art of building it. Whether, therefore, Australia is supposed to have been colonised from the Dekkan, or the Dekkan from Australia, there appears to be no justification for the hypothesis that the passage was effected through the open sea. On the other hand, there is a very easy and safe passage from Australia to the Dekkan by way of the Malay Archipelago; but if colonisation took place in either direction by slow spreading from island to island, by this route, what has become of the former Australioid population in the vast tract which stretches from New Guinea to Siam?

The Negroid races present problems of a corresponding character. There is a great space, between the African and the Indo-Pacific divisions of that area, in which not a trace of a true Negro has been discovered.

Again; there is a vast break between New Caledonia and Tasmania, though the populations are closely allied Negritos; and the Tasmanians were, when discovered, so utterly devoid of the means of making a long sea journey, that we are debarred from assuming that they migrated across a very stormy ocean from the one of these islands to the other. And, by way of complicating the matter, it will be observed, if the centres of the Negro and Negrito areas and that of the Australioid regions of the Dekkan and Australia are joined by straight lines, these lines intersect one another.

The only means of throwing any light upon these singular facts appears to me to be by paying attention to the changes

which have taken place in the physical geography of the earth in comparatively recent times.

The Sahara, which limits the negro area of Africa on the north, is now well known to have been covered by a sea which was continuous with the Mediterranean, in times that are geologically modern. Ultra-Sahara Africa seems to have been, practically, a great island for a long period; and to the isolation thus arising it would appear to owe its peculiar race of men, as well as the singularities of the rest of its Fauna. Thus, the age of the Negro race exceeds that of the great physical change by which the bottom of the sea which lay south of the Atlas was converted into the driest and hottest of deserts.

On the other hand, it is certain that, in geologically recent times, the region which lies east and north of Australia has undergone great depression, whereby, in many cases, what were once continuous masses of land have been converted into chains of islands. Is it not possible that the isolation of the Tasmanians from the New Caledonians is to be accounted for by some such change, not greater in amount than that which we know to have occurred in other parts of the Pacific?

And if there is fair ground for believing such changes as these to have occurred in North Africa and in the Pacific, is it too rash to suppose that the present discontinuity of the Negroid and Australioid areae may be due to similar changes, which have submerged formerly existing island stepping-stones beneath the waters of the Indian Ocean?

If there be any weight in these arguments—and I cannot but think there is—the distribution of the Negroid and Australioid races of man is as strong evidence of his antiquity as the occurrence of his works in the gravels of Hoxne and Amiens.

The discussion on this important communication was opened by Professor CARL VOGT in the following terms, which are here given in a summary of his speech communicated by Professor Vogt himself since the adjournment of the Congress:—Prof. Carl Vogt ‘considère le point de vue sur lequel s’est

placé M. Huxley par rapport à la distribution des anciennes races humaines comme très-important, mais il doit faire des réserves quant à la classification, surtout des races mongoloïdes et xanthochroïdes. Les races négroïdes et australoïdes sont beaucoup mieux et, suivant son appréciation, assez exactement définies, surtout quant aux races actuelles : il a des doutes sur quelques rapprochements avec des branches historiques anciennes, telles que les Égyptiens. Mais ces doutes à part, les études de M. Huxley prouvent bien que la distribution des deux races, que nous pouvons appeler les races primitives et anciennes, ne peut être comprise que par des rapports différents entre les terres fermes et les mers, de même que nous ne pouvons comprendre la diffusion actuelle des animaux et des plantes qu'en admettant des changements considérables survenus dans l'état de la surface du globe. Mais il est évident aussi que les changements survenus pendant l'époque dite diluvienne, et qui nous sont connus, ne suffisent pas pour cette démonstration. L'ancienne mer de la Sahara explique bien pourquoi les nègres n'ont pas franchi cette partie actuelle du continent africain pour arriver aux bords de la Méditerranée, comme d'un autre côté l'existence de communications terrestres entre l'Afrique et l'Europe à travers le détroit de Gibraltar et entre l'Angleterre et la France à travers la Manche jette des lumières sur la diffusion d'autres races humaines et animales ; mais toutes ces données ne suffisent pas, et nous forcent impérieusement à admettre que la diffusion des races primitives est arrivée à une époque encore plus reculée—savoir, dans les temps tertiaires. Or, nous avons déjà certaines données qui rendent l'existence de l'homme probable pendant la dernière période tertiaire, même en Europe, et on peut croire que des recherches ultérieures dirigées dans ces sens et faites dans des contrées non encore explorées sous ce point de vue nous fourniront des preuves positives. Toujours est-il que la dispersion par groupes incohérents, par îlots perdus au milieu d'autres races, qui est si remarquable pour les races négroïdes et australoïdes, nous force à reconnaître que leur diffusion s'est faite à une époque très-reculée, et que la continuité primitive de l'habitat de ces races a

été rompue et coupée par des changements de niveau subséquents, par la formation de bras de mer là où il y avait des terres fermes, et de terres là où il y avait des mers. Si ces raisonnements sont justes, on peut aussi les appliquer aux deux autres races. La continuité actuelle de leur dispersion, et conforme à l'état actuel de la surface terrestre, prouve que cette dispersion s'est faite dans une époque beaucoup plus récente, lorsque les rapports entre les terres et les mers étaient déjà fixes comme nous les voyons aujourd'hui. Vis-à-vis des autres races australoïdes et négroïdes ce sont donc des races relativement modernes. Mais il faut faire ici une réserve importante. Les deux dernières races adoptées par M. Huxley n'ont pas la même valeur que les deux autres. Il est impossible de les caractériser avec la même précision. M. Huxley y a même réuni des types tout-à-fait disparates, réunion contre laquelle il faut protester. Ainsi jamais M. Huxley fera croire à M. Vogt que les Eskimaux à tête si allongée soient de même race que les Lapons à tête si courte. Il faut donc reconnaître que ces races mongoloïdes et xanthochroïdes, comme les appelle M. Huxley, sont des races mixtes—c'est-à-dire, des produits de mélanges de races primitives, dont il faut chercher les souches, et que même ces deux races, considérées comme mélanges, ne suffisent pas pour donner une place convenable à tous les types humains tels que nous les connaissons aujourd'hui. En laissant de côté l'Amérique, sur laquelle M. Vogt n'a pas des études suffisantes, la population actuelle de l'Europe et d'une grande partie de l'Asie doit donc être considérée comme composée de types dérivés de souches primitives, mais dont les caractères ont été modifiés d'un côté par le mélange et de l'autre côté par le perfectionnement successif. Enfin, ces considérations prouvent de nouveau combien il est nécessaire, dans l'état actuel de la science en général et de l'anthropologie en particulier, d'examiner les races au point de vue de leur origine, de leur histoire et de leur développement, et de combiner les résultats obtenus avec les données fournies par d'autres branches de la science et surtout de la géologie, au lieu de se borner à l'examen des races en elles-mêmes et à

leur état actuel, comme on a fait généralement jusqu'à présent.

Professor PAUL BROCA then spoke as follows:—Si j'ai demandé la parole au sujet de l'importante communication que vient de nous faire M. Huxley, ce n'est pas, je me hâte de le dire, pour combattre le fond même de sa théorie. Bien au contraire, j'ai éprouvé un véritable plaisir en entendant la voix autorisée du savant professeur développer des principes généraux qui sont les miens. Ainsi j'admets, comme M. Huxley, l'inégale antiquité des types humains, et sans oser rien affirmer sur les époques successives de leur formation, je pense que ces différents types se sont répartis inégalement et par couches superposées, comme par une sorte de stratification; j'admets en second lieu, avec notre savant collègue, que cette répartition a dû s'effectuer antérieurement aux révolutions qui ont donné à nos continents leur configuration actuelle, et j'en conclus sans hésitation qu'un océan peut séparer deux peuples sauvages, deux populations complètement ignorantes dans l'art de la navigation, sans que nous soyons autorisés par là à nier toute communauté d'origine entre ces deux groupes humains. Donc, je le répète et je m'en félicite, les principes de M. Huxley sont les miens, et nous sommes d'accord sur la doctrine ethnogénique générale. C'est dans les détails que nous nous séparons sur plusieurs points qui, il est vrai, ne manquent pas d'importance. Je lui demanderai donc la permission de lui présenter maintenant quelques objections. M. Huxley réduit à quatre le nombre des souches primitives de l'humanité. Cela me semble un peu arbitraire, et tout au moins non suffisamment démontré. Quant à moi, en ma qualité de polygéniste, je reconnais bien l'existence de plusieurs groupes primitifs distincts; mais combien y en avait-il dans l'origine? combien en a-t-il disparu? et combien en reste-t-il aujourd'hui?—voilà ce que je n'oserais certainement pas dire d'une manière positive. Aussi M. Huxley me semble-t-il un peu hardi lorsqu'il nous retrace aujourd'hui à grands traits une division du genre humain qui n'est pas d'ailleurs sans analogie avec celle de Blumenbach, puisque, comme celle du naturaliste allemand, elle



repose principalement sur la distinction des nègres, des Européens et des Mongols. Il me paraît en outre que la classification proposée par M. Huxley ne réunit pas complètement les caractères indispensables à toute bonne classification naturelle. Oserai-je le dire, j'y vois plutôt un système qu'une classification vraiment naturelle. Or, ce système a le grave inconvénient qu'un seul caractère y sert de base aux divisions principales, et ce caractère n'offre peut-être pas toute la fixité désirable quand il s'agit d'établir des groupes bien déterminés. Quel est, en effet, ce caractère de premier ordre qui doit nous servir, d'après M. Huxley, à distinguer les quatre groupes principaux?—c'est, si j'ai bien compris, la couleur des poils et de la peau. Eh bien, prenons le premier groupe, celui qui, sous le nom de '*mélanochoï*,' comprend à la fois les Égyptiens anciens et modernes, les Indous, les Abyssiniens, les Ibères, les Berbères, les Australiens et les Mélanésiens; faisons un moment abstraction de la couleur du poil, et ce groupe nous paraîtra purement artificiel; nous y trouverons en effet confondus des individus à poil laineux, d'autres à poil lisse, et à côté d'hommes à peau brune ou noire, nous y verrons l'Ibère, dont la peau est blanche. Et je ne parle pas de la forme du crâne, qui, dans ce même groupe, nous offrirait des variations tout aussi considérables; cependant je ne puis me défendre de croire que la forme du crâne est un caractère plus important, plus stable que la coloration de la peau et du poil, non pas que je nie absolument l'utilité des caractères purement extérieurs, mais la conformation crânienne me paraît être dans un rapport bien plus intime avec l'organisation, avec la nature spécifique des individus et par suite des groupes qu'ils composent. Il me semble donc hors de doute que des différences notables séparent les races comprises dans le premier groupe de M. Huxley; mais à supposer même que l'anatomie et la physiologie fussent favorables au système de notre collègue, a-t-il du moins en sa faveur la vraisemblance? Est-il possible d'admettre que de la même souche soient sortis les Australiens et les Égyptiens?—les Australiens, peuplades inférieures, placées par leurs caractères physiques



et intellectuels au dernier degré de l'échelle humaine, et tellement inférieures que tous les efforts des Anglais n'ont pu réussir à les arracher à la sauvagerie ; et les Égyptiens, race précoce, douée de tous les instincts civilisateurs, et que l'histoire nous montre parvenue au plus haut degré de culture, alors que l'univers entier restait encore plongé dans la plus complète barbarie ? Je n'analyserai pas les autres groupes un à un. J'y trouverais certainement la base de critiques du même genre. Il me serait facile de montrer que, reposant sur des signes d'une valeur tout aussi contestable, ils ne sont pas moins artificiels que le premier, et qu'à un seul caractère extérieur correspondent souvent des formes crâniennes fort différentes ; mais j'ai hâte d'arriver à un point qui me touche de plus près, car il s'agit de mon pays, et ce sera ma seconde observation. Il y a dans le système de M. Huxley une lacune à laquelle je suis très-sensible ; vous allez voir pourquoi. Notre collègue admet quatre groupes principaux ; or je vois bien, sur la carte qu'il nous a présentée, que l'un de ces groupes, celui auquel appartient l'Angleterre, s'étend sur le nord et le nord-est de la France, qu'un autre groupe, celui qui vient de l'Australie, atteint l'Afrique et l'Italie, mais entre les deux j'observe un vide assez considérable, une zone *incertæ sedis* qui comprend la plus grande partie de la France, et en particulier celle où je suis né, et je me demande avec anxiété si je dois chercher mes ancêtres parmi les Australiens et les nègres, ou parmi les peuples qui occupaient, au temps de l'âge de pierre, la Grande-Bretagne et la Belgique, et qui d'ailleurs ne devaient pas être blonds, quoique la carte de M. Huxley puisse le faire croire. Je soumettrai à notre savant collègue une dernière objection. Je me demande, quelle est la valeur qu'il accorde aux caractères crâniens, et en particulier à la brachycéphalie ou à la dolichocéphalie ? Il m'a paru qu'il en faisait grand cas lorsqu'ils venaient à l'appui de sa doctrine, et qu'il les reléguait volontiers en arrière lorsqu'ils venaient la contrarier. Ainsi, il nous a dit que la dolichocéphalie caractérisait l'un de ses quatre groupes, et que la brachycéphalie en caractérisait un autre. Est-ce donc qu'il reconnaît à ces

caractères crâniens une importance réelle? Ce n'est certes pas moi qui le contredirai sur ce point, tout au contraire; mais alors je m'étonne de trouver dans son groupe blond des brachycéphales et des dolichocéphales. Cela me semble contradictoire, et je voudrais, en matière de classification, des données et des résultats un peu plus nets, un peu plus précis.

Mr. A. R. WALLACE said that as M. Broca had expressed a difference of opinion with Professor Huxley, he should like to say how far he could support the views of the latter from his own personal observation. The Papuans had appeared to him to possess so many striking resemblances to the Negroes, of a mental as well as a physical character, that he had thought they must have some affinity to the Negro race. He had never, however, expressed his opinion upon this subject, because it was so entirely opposed to that generally entertained. As Professor Huxley had stated his views upon the subject, he wished to say that he agreed with him in relation to it. There could be very little doubt that the connection between the Papuans and the Negroes was closer than between the Papuans and the Australians. If this point could be proved, it would lead to some extraordinary conclusions with respect to the antiquity of man. He should be inclined to state his case much stronger than Professor Huxley had done. There were two modes of testing whether countries had formerly been joined together, and one was the similarity existing between the kinds of animals, and also of the depth of the sea between them. When these two points coexisted, the evidence was very striking that the two portions of land had been joined together. For instance, hardly a single animal was different in England from what it was in France. The sea also between them was not very deep. Hence we concluded that these two countries had once been joined together. Now there was just a similar kind of evidence existing here. The sea between New Guinea and Australia was shallow, not more than 100 fathoms in depth; the animals also were similar. On the other hand, between New Guinea and Africa there was the remotest possible affinity in their animal productions,

while one of the deepest oceans rolled between them. It was therefore certain that the connection between Australia and New Guinea was comparatively recent, while that between Africa and New Guinea, if it ever existed, was exceedingly remote. Yet, strange to say, the men of New Guinea were more closely allied to the Africans than they were to the Australians. Now we could not account for this strange distribution of man by the theory of only one series of changes in the earth. There must have been a time not very remote when Australia and New Guinea were joined, so as to allow land animals to pass from one to the other. But if we suppose man to have spread from the one country to the other at that time, then the great differences that exist between the Australians and the Papuans must have been produced since, and we have no possible clue to the resemblance of such widely separated races as the Papuans and the Negroes. Their affinity, if it really is one, implies changes of physical geography vastly greater, and therefore vastly more ancient, than those which have determined the distribution of allied species of animals. It would imply (what there is other evidence to indicate) that the antiquity of the human race is comparable with that of the *genera*, rather than of the *species*, of other mammalia.

Mr. E. B. TYLOR said that though Professor Huxley had not brought forward the evidence of language in support of his classification of races, he appeared to have taken it into consideration. His Mongoloid family corresponds to the Turanian family in language, if this term be taken in its narrow sense, as not including the Dravidian of South India. It would scarcely be safe to comprehend these in the Turanian family; and if they are not so included, then it may be generally asserted that comparative philology does not contravene, though it may not generally support, Professor Huxley's classification, for no people classed by him in one division would be removed on linguistic evidence to another.

Dr. HOOKER, F.R.S., remarked that though there were many agreements between the geographical distribution of man and other animals and plants, there were as great differences, as was to be expected when it was considered how different the means of transport were, and how differently plants and

animals may be affected by the same climatic conditions. He also believed that Mr. Wallace's great discovery of the limitation of two zoological provinces by the Strait of Lombok equally applied to botanical provinces; and if Mr. Huxley's statement that it also applied to ethnological provinces proved true, he believed that it was the only hitherto discovered physical feature in the globe that had proved to be an absolute line of demarcation between *contiguous* ethnological, zoological, and botanical provinces.

Mr. BUSK said it seemed to him perfectly evident that, as science progressed, we should have to give up some of our favourite theories. If we were to accept this classification of Professor Huxley's, we should have to give up the conclusions which many had arrived at and considered fully established—namely, that the characters of the bony remains of men afforded certain indications of the affinities of the race to which they belonged.

Professor HUXLEY, in reply, congratulated himself that his ideas had met with no more unfavourable criticism from colleagues so competent to judge them. It was by no means his intention to suggest, that the existing races of mankind might not be of much greater than quaternary age; on the contrary, he was prepared to carry them back much further. With respect to the cranial characters upon which M. Vogt and M. Broca had dwelt so strongly, he could only appeal to the indubitable fact, that those characters, constant as they may be in one group of mankind, are eminently variable in another. The skulls of a large proportion of the South Germans and of the Swiss are as short and broad as those of Tartars, while those of the Scandinavians are as long as those of Esquimaux. But surely no one will pretend for a moment that the tall, fair-haired, blue-eyed Germans and Scandinavians, whose languages differ little more than as dialects from one another, and who are connected by innumerable other ties, belong to different races of mankind. If they do not, why should the Esquimaux and the Lapp?

The following paper, the substance of which was communicated by Mr. BUSK to the Congress, has since been enlarged and amplified by the author, and is now inserted in full.

ON THE CAVES OF GIBRALTAR IN WHICH HUMAN REMAINS AND WORKS OF ART HAVE BEEN FOUND.

BY GEORGE BUSK, Esq., F.R.S., F.G.S., AND V.P. ETH. SOC.

CHAPTER I.

ALTHOUGH presented to the Congress in my name, it will be seen that a very considerable part of the following account of the Gibraltar Caves is derived from the reports and letters, and given in the words of my excellent friend, Captain Frederic Brome, late Governor of the Military Prison, whose unwearied labours during the last five or six years have been devoted to their exploration.

I have also been greatly aided in my task by the joint notes taken both here and on the spot by the late Dr. Falconer and myself, and contained in a report prepared for the British Association in 1864, immediately before our visit to Gibraltar, and in which was embodied an account of the main points then known of the geology and topography of the Rock. But on the former subject I have here, for the sake of brevity, touched very slightly, as it is but distantly connected with the more immediate object of this communication.

Dr. Falconer, as is well known, took the liveliest interest in the Gibraltar researches, as forming part of that extended study of the Mediterranean quaternary fauna to which he had devoted so much time and attention; and of which he had contemplated embodying the results in a general memoir on that fauna. It is deeply to be regretted that his untimely death should have prevented the completion of this great design, for the execution of which he was so peculiarly qualified.

In the following pages I have, however, only attempted

to give an account of the recent discoveries in Gibraltar and have confined myself to that locality alone.

In doing this I have found it convenient to subdivide the subject into two distinct parts: the one including the Caves as related to man and his works, which is given in the present communication; and the other an account of the more ancient animal remains, found in the deeper fissures, or embedded in the true ossiferous breccia, and which, in my opinion, belong distinctly to an epoch anterior, though, it may be, not very long anterior to the period when man began to take up his residence on the Rock.

The publication of this second part, which has no immediate connection with the objects of the Congress, will take place elsewhere.

But since, for the clear understanding of the nature and conditions of the various caverns and fissures, of which an account is here given, some acquaintance with the general geological relations and topography of the promontory is requisite, I will commence with some remarks on those subjects, compiled from various sources, and based in part upon the observations which Dr. Falconer and myself were able to make during our brief stay in Gibraltar in the year 1864.

*1. Introductory Remarks on the Geology and Topography of the Rock of Gibraltar.*

The principal physical and topographical features of the Rock of Gibraltar are familiarly and well known through the minute and careful surveys which its importance as a fortress has demanded of its holders, for the vast defensive works that have been carried on almost incessantly upon it during the period of our occupation.

The Rock and its Bay, with the neighbouring districts, have passed successively under the dominion of a savage prisca race, of the Phœnician, Carthaginian, Roman, Goth, Saracen, and Spaniard. The ruins of Carteia at the head of the bay, and within a few miles of the gates of the fortress, have yielded numerous vestiges and monuments of the ancient Semitic and Roman occupants of the country; and tumuli



in the neighbourhood of these ruins have also afforded the polished stone implements of a still earlier race; but, in the Rock itself, no relics of this kind had, before the present time, so far as I am aware, been discovered belonging to a period anterior to the invasion of Spain by the Arabs. The relics of the ancient or primitive inhabitants, and even those of the Roman period, have for the first time been brought to light since Captain Brome commenced his explorations.

The geological changes which the promontory has undergone during a comparatively late period, through movements apparently of upheaval and depression, have been very numerous and remarkable, and attended with great local disturbance of the Rock. These changes have been the subject of special research by that skilful observer, the late Mr. Smith of Jordan Hill, from whose essay on the 'Geological Structure of the Rock of Gibraltar' the following particulars have been chiefly derived. And as our own observations, so far as our brief stay on the Rock allowed us the opportunity of judging, led us to coincide in almost every essential point with Mr. Smith, I have the less hesitation in relying upon the information afforded by him.

The Rock, or Peninsula as it may be termed, of Gibraltar\* is a detached promontory, composed principally of limestone, about three miles long and three-quarters of a mile in its greatest width, and placed in a direction nearly due north and south. On the western side its base is washed by the tidal waters of the Atlantic, and on the eastern by the tideless waves of the Mediterranean from which it rises, nearly throughout its length, in an almost sheer precipice. It is connected with the main land by a sandy, level isthmus, not more than ten feet above the level of the sea. The entire mass is divided into two primary portions, the northern, which includes three-fourths of the length, being much more elevated than the southern. The elevated portion again is subdivided into three distinct segments or eminences, separated by two irregular depressions, which are termed respectively the Northern (Plate I *a*) and Southern (*b*) Quebrada; so named from the Spanish '*tierra quebrada*,'

\* Plate I.

or 'broken ground;' the Rock at those depressions being much fractured and dislocated. The northernmost portion, termed the 'Wolf's Crag,' or 'North Front,' is terminated by a cliff 1250 feet high, which is naturally almost perpendicular, and where not so by nature has been rendered inaccessible by escarpment. The middle portion, 'Middle Hill,' or 'Signal Station,' 1255 feet high, forms the central eminence; whilst the southern division, the 'Pan de Assucar,' or 'Sugar Loaf Hill,' which is surmounted at the highest point of the Rock by O'Hara's Tower, rises to a height of 1408 feet above the sea. The declivity to the south from this eminence is very abrupt, but not so precipitous as to prevent its easy ascent. It terminates in the 'Windmill Hill Flats,' or plateau, a tolerably level plain about half a mile in length and a quarter of a mile in breadth. At its northern border the surface of this plateau is about 400 feet above the sea, or 1,000 feet below the summit of the Rock; and it slopes gradually to the south at an angle of about  $11^{\circ}$ ; so that at its southern termination in a vertical inland cliff about 100 feet high, its height above the sea is from 250 to 300 feet. It is bounded on the east and west sides also by nearly perpendicular cliffs, whose base is about 100 feet above the sea, and some distance inland. The succeeding and southernmost portion of the Rock, termed the 'Europa Flats,' also consists of a tolerably even plain, which at the northern border adjoining the Windmill Hill escarpment is about 100 feet above the sea, from which level it gradually slopes to about 50 feet, terminating in 'Europa Point,' the southernmost extremity of the peninsula. The Europa Flats on the eastern side are continuous with the terrace, from which rises the eastern escarpment of the Windmill Hill plateau, under whose shelter is situated the summer residence of the governor. (*Vide* Plan, Plate II.) On the western side the Europa plateau rises considerably, ending in the numerous large ravines above Europa Bay and at Buena Vista. It would seem that the rocky sea bottom, where visible at the base of the eastern cliffs of the Europa plateau, and beyond the masonry by which its southern flank is covered, constitutes a rocky plain precisely of the same character as the 'Windmill Hill' and 'Europa Flats;' and this lower plain

might consequently be described as a third level or step ; and at the southern extremity of the Rock there was, I believe, formerly an extent of surface uncovered by the water, and termed the Lower Europa ; but the defensive works, executed in that situation, have removed nearly all traces of this at the present time. Whilst the eastern face of the Rock is a nearly perpendicular precipice—the escarpment of the limestone strata—its western face forms an irregular slope, interrupted here and there by longitudinal cliffs and ravines, and gradually shelving at bottom into the gentle declivities upon which the principal part of the town of Gibraltar is built. Towards the north end, and as far south as Rosia Bay, which is nearly in a transverse line with the northern border of the Windmill Hill plateau, the surface is composed almost entirely of a highly ferruginous silicious sand, termed from its colour the ‘Red Sands ;’ but, at the point just indicated, the sand for the most part disappears, and is succeeded by a hard ferruginous shale, which appears to rest conformably on limestone.

Except these silicious beds on the western base, the mass of the Rock consists of a secondary limestone, which is considered to be of jurassic age. It is very compact and hard, and wherever the surface is sufficiently exposed, is seen to be intersected throughout by ramifying fissures, which occasionally widen out into extensive caverns, either empty or filled with bone breccia or crystalline spar. The principal reason undoubtedly of this fractured condition is to be sought in the circumstance, that the strata, as has been conclusively shown by Mr. Smith, and as is sufficiently obvious to the most superficial observation, have been subjected to very great disturbances, and twisted, as it were, in different directions. This is shown very plainly in the fact, that the angle of stratification varies very much in different parts, its direction indeed being reversed at the opposite extremities of the promontory.

In the northern segment the strata dip to the west at an angle of about  $19^{\circ}$  or thereabouts, and this inclination is continued as far as the northern ‘Quebrada’ (*a*, Plate I.). But in the Middle Hill, or between the north and south

‘Quebrada,’ the inclination of the strata, still to the west, is at an angle of  $38^{\circ}$  or thereabouts; and it is continued at this angle, or near it, to the south ‘Quebrada’ (b); separating the middle from the south hill, or ‘Sugar Loaf,’ where the strata dip to the west at an increased angle of  $57^{\circ}$ ; and at the southern end of the ‘Sugar Loaf Hill’ they become nearly vertical. We then come to the great fall in height from 1400 to 400 feet, and on reaching the Windmill Hill plateau find, upon looking at its southern face, that the strata are actually turned over, and now dip at an elevated angle to the east. What the direction of the dip may be in the limestone of Europa Flats, I am not aware, but from the extremely rugged nature of the surface, from the numerous fissures and ravines by which the plain in question is bounded to the west, and from the excessively fissured condition of the Rock where recently exposed by escarpment, as in Europa Bay, and from the rocky nature of the sea bottom to a considerable distance round the southern and western end of the promontory, there is every reason to suppose that the disturbance by which the strata of Windmill Hill had been tilted over, was not less in amount, but probably much greater, in the southerly direction.

Mr. Smith was of opinion that the movements by which the limestone strata have been affected in the manner above described were of two kinds: 1. Repeated, sudden, partial movements, involving angular dislocation and uplifting of the strata. 2. Subsequent general vertical movements, by which the whole mass has been elevated and depressed. But into the facts and reasoning by which he was led to this conclusion, it would require far too much space here to enter; nor for my present purpose is it requisite to do so, inasmuch as there is no reason to suppose that any great disturbance or change of level of the Rock has occurred within the human period. The marks of marine action, it is true, and the existence on the eastern flanks of successive sea bottoms of comparatively modern origin up to the height of at least 900 feet, afford sufficient evidence of the truth of Mr. Smith’s inference, ‘that since the testaceous fauna was the same as the present, many movements, both of upheaval and de-

pression, must have taken place,' and 'that the whole mountain up to its summit has been submerged subsequently to the last of the great disturbances;' but all this appears to have preceded the advent of man upon the Rock.

As is well known, *caves* constitute a prevailing feature of limestone rocks everywhere, and in no place are they more numerous within a similar compass than in the promontory of Gibraltar, which has in fact on that account sometimes been termed the 'Hill of Caves.'

The caves are of two kinds: 1. Littoral or sea-caves, scooped out horizontally by the waves at the sea level; of which kind numerous instances are exhibited all along the base of the eastern face, and, as has been before said, successive terraces, one above another, are visible on the same face, each furnished with its line of sea-caves, exactly like those at present at the level of the water. It would seem, however, that most, if not all, of these caves owe their origin to their being situated in the line of a fissure or fracture of the rock of which the sea has taken advantage to begin its scooping action. 2. Inland caves, which do not exhibit any appearance of marine erosion, but may be described as ramified and intersecting fissures, descending more or less vertically to great depths. Consequently they are of the same nature and origin as the rents in which the bone breccia is found, enlarged perhaps in some cases by pluvial erosion, but in others, as it would seem, by actual separation of the walls. That these fissures, after their original formation, have been subjected to motions of displacement, is evidenced by the frequency with which large detached blocks of rock, evidently either broken off close to the spot where they are lodged, or which may have fallen down the vertical fissure until they were arrested in a narrower passage, are met with. It will also be observed that Captain Brome, in describing several of the caves, mentions the occurrence of very thick pillars of stalagmite, which have been broken transversely, the two fragments being displaced and sometimes re-united by fresh stalagmitic deposit, sometimes remaining quite separate.

The principal littoral or sea-caves with which I am acquainted in the rock, or which have received names, and whose respective situations will be seen in the Plan, Plate II., are:



1. Martin's Cave, situated at about 700 feet above the sea, on the eastern face of the Rock, and beneath O'Hara's Tower.

2. Fig Tree Cave, which is placed above and a little to the south of Martin's, and apparently belongs to a higher terrace.

3. Some caves just above the blown sands in Catalan Bay.

4. Monkey Cave, a very large and shallow cavern, situated on the lowest terrace, about 100 feet above the present level of the sea, immediately beyond the last Europa Advance Battery, and also on the eastern face.

5. Beefsteak Cave, which is clearly a sea-cave, but now situated far inland in the cliff which bounds the Europa plateau on the south.

6. The Genista Cave, No. 4, the opening of which is about 40 feet below the top of the eastern cliff of Windmill Hill plateau, and nearly over the stables of the Governor's cottage.

7. Poca Roca Cave, which has in all probability been widened by marine action at its entrance, but communicates apparently with extensive ramified fissures.\* This cave is in the western face of the rock, in the line, or near it, of the northern Quebrada, and about 600 feet above the level of the sea.

But, besides these well-known instances, there are very many caves of the same kind, of smaller size, on the eastern face, and several are seen excavated in the modern elevated strata, behind the Governor's Cottage, where a considerable thickness of that deposit still remains. Such caves as these clearly have not connection with fissures of the limestone, to which they do not all of them reach.

The principal fissure-caves with which we have any acquaintance are:

1. The famed St. Michael's Cave, whose entrance is on the western face in the line of the southern Quebrada, and about 1100 feet above the sea.

\* There is every reason to believe that the fissures connected with the Poca Roca Cave extend quite through the rock and open on the eastern face above Catalan Bay, inasmuch as they are found filled, as stated by Captain Brome, with sand of the same kind as that which forms the 'blown sands' of that bay.



2. The Genista Cave, No. 1, together with the eastern fissure with which it communicates on the Windmill Hill.

3. The Genista Cave, No. 2, about 1,000 yards distant, and to the south, and probably also connected with the continuation of the eastern Genista fissure.

4. Genista Cave, No. 3, but which is regarded by Captain Brome more in the light of a sea-cave. The opening is on the eastern side of the Windmill Hill plateau, nor far from the edge of the cliff.

From the above brief statement it will be seen, that the principal caves, and especially the fissure-caves, are placed in or near the north or the south Quebrada, or near the still greater line of disturbance, between the elevated and the depressed portions of the promontory, and where the strata from dipping to the west are turned over and dip to the east, a change that must have been attended with great disruption of the Rock.

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## CHAPTER II.

DESCRIPTION OF THE VARIOUS CAVES DISCOVERED OR EXPLORED BY CAPTAIN BROME, WITH AN ACCOUNT OF HIS EXPLORATIONS DURING THE YEARS 1863-1868.

THE exploration of the caves was commenced under the following circumstances :

It having been determined, in the year 1862, to enlarge the boundaries of the military prison on Windmill Hill,\* and to construct for its use a large water tank, a considerable space on the eastern side of the prison was enclosed by a high wall. Within the enclosed space, and close to its south-east angle, an excavation was made for the proposed tank. This excavation led to the discovery of the first and most important of the series of caves on the Windmill Hill plateau, which it is to be hoped will be known to all time by the name which has been given to them, in allusion to and in honour of their discoverer and explorer.

\* Vide Plate II.

In the progress of the great works which have been carried on in Gibraltar during the last century, in the scarping of the crags and the mining of the covered galleries, numerous objects of great interest have no doubt at different times been brought to light. But the eminent commanders under whom, at various important periods, these gigantic works have been executed, have been either too much occupied by their weighty duties in times of war, or have not had their attention directed to the interesting disclosures of the secrets that lay hid in the interior of the rock. Nor, with several very eminent exceptions, have the members of the scientific branches of the service apparently shown that interest in, or exercised that vigilance respecting, the natural products of the rock, which at any rate in time of peace might have been expected of them. Much precious material has, in consequence, been irretrievably wasted, or become so widely dispersed, as to have lost much of its value for the purposes of comparison. It is a strange fact indeed that, although at one time a museum containing a considerable collection of the natural curiosities of the promontory, and of objects of archæological interest from the neighbourhood, existed in the garrison, this has since been allowed to be entirely broken up, and the collection either lost or widely scattered. And it is a still stranger fact that, even very recently, and after the attention of archæologists and palæontologists has been thoroughly awakened to the importance of Gibraltar as a field of research, the military authorities at home have refused to sanction the very trifling expense required to fit up an appropriate room, which is already provided, as a local museum, than which, in such a spot above almost any other, nothing could be more interesting, nor, as it might be supposed, more useful, as a means of affording rational and pleasing recreation, and instruction to the officers and men of the garrison.

Fortunately when the excavations on Windmill Hill were commenced, an accomplished and distinguished officer, fully alive to the importance of science, was in command of the fortress; and it was equally fortunate that the subsequent explorations were carried on by an observer so able, ener-

getic, and vigilant as Captain Frederick Brome, at that time governor of the prison.

To the enlightened and lively interest which Sir William Codrington always took in the exploration of the caves, and to the countenance and assistance which was uniformly rendered by him to Captain Brome, and which was continued up to the time of that gentleman's departure from the Rock, by Sir W. Codrington's successor, his Excellency Sir Richard Airey, Captain Brome attributes in a large measure the successful issue of his operations.

These operations, which were unremittingly continued from April 1863 to December 1868, have of necessity required an amount of labour, and involved sometimes a degree of responsibility which it is not very easy to over-estimate. But this labour and responsibility have been ungrudgingly and most disinterestedly given and incurred by Captain Brome, who, with the aid of the prisoners and their warders under his command, has in those five years conducted with surprising success an amount of difficult exploration never before equalled, and made collections in the public interest of unrivalled value—and, it may be said, without any expense whatever to the nation. I am the more desirous of calling attention to Captain Brome's deserts, knowing well that, though substantially as yet unrewarded for his labours in the cause of science, but rather the reverse, he will have the liveliest satisfaction in finding that his merits are fully appreciated by all who have the interests of science at heart, and in feeling that he has at length fulfilled to the letter the hope and anticipation expressed by the illustrious Cuvier in reference to the ossiferous breccia of Gibraltar:—‘*Que serait-ce si quelque naturaliste résident sur les lieux prenait la peine de recueillir et de dégager avec soin [les ossemens] qui se découvriraient pendant quelques années, comme je l’ai fait pour [ceux] de nos gypses ! D’après ce que nous allons voir, on ne peut douter qu’il n’y fît des récoltes abondantes et intéressantes.*’

As it would be impossible to give a better or more succinct account of the various caverns, &c. explored by Captain Brome than is conveyed in his own words, they are here

given almost unaltered, commencing with his Report on the Genista Cave, No. 1, dated August 21, 1863.

1. *Genista Cave, No. 1 (Pl. III.).*

‘The Secretary of State for War having approved, at my suggestion, of the employment of the prisoners on the new works during their construction, this arrangement involved the necessity of a constant supervision on my part, which afforded me an opportunity of watching the progress of the works, and has enabled me to offer the following remarks, viz.:

‘The first excavations were commenced on November 12, 1862, for the new boundary walls and tank. The space marked out for the tank, under which the cave was discovered, was in the angle formed by the excavation for the south and east boundary-walls; its dimensions were to be sixty feet by fifty feet, and fourteen feet deep. On removing the earth from this space, which varied from two to four feet in depth, an irregular surface of compact limestone presented itself; in which the only fissure visible was an open vertical one about six feet long and five inches wide, between two large blocks of limestone; the disturbed state and peculiar position of these masses appeared to me, with the fissure, to be remarkable, and I drew the attention of Lieut. Buckle, R.E., in charge of the works, to them, who observed, that “it was merely one of those fissures in which the Rock of Gibraltar abounded.” Labour was directed to quarry out the limestone to the required depth for the tank (fourteen feet), and, about the end of February, after blasting out a portion of solid rock at a depth of nine feet from the original surface, a few bones were found in the bottom of a small fissure, under some dark mould; they were lying without order in all directions, and mostly fractured.

‘Having been led to suspect, at a very early stage of the operations, that the open vertical fissure already mentioned was connected either with a larger one below, or a cavern, I watched the excavations as they progressed near this spot with considerable interest, and on April 23 (St. George’s Day), while excavating for the foundation of the south wall,

the prisoners came upon a rock, which had evidently once formed part of a cave; it was covered with stalactites and conglomerate; near this spot a boar's tusk was found, and a few fragments of pottery, land and marine shells, &c. The prisoners were provided with baskets, and I directed them to collect carefully every specimen, *however small*, for my inspection, and this was most diligently attended to under the superintendence of the prison officers.

‘The next step was to ascertain the direction and bearings of the cave, and on May 4, 1863, it was found to run off, for a distance of forty feet, at right angles with that portion of the south side already excavated, and then in a zigzag form along the whole excavation for the tank (sixty-three feet) into an oblique passage on the north side: this passage, nine feet high and four feet wide, was connected with the original surface by a closed vertical fissure of small dimensions, which, as well as the passage below it, was choked with hard red clay: in the latter there were a few animal bones found encrusted with a hard red ochreous cement.

‘The upper cave, only two sides of which have been discovered, is now intersected by a wall thirty-one feet high, which prevents any further excavations to the eastward, unless they are made on the other side of the wall, where, no doubt, the ramifications of the cave extend to some distance.

‘In the centre of the cave, large blocks and masses of limestone, some covered with stalagmite, are lying heaped upon each other in every direction. There is a most remarkable mass lying near the south and west sides, twenty feet long, thirteen feet broad, and nine feet high. On this mass there are no stalagmite formations, and the top of it must have nearly reached the roof of the cave. There is a perpendicular fracture down its centre, which appears to have been caused by its having lodged in its fall on some boulders which are seen beneath.

‘The south and west sides of the upper cave, where most of the human and animal remains, works of art, &c. were found, were completely choked to the roof (with no intervening space between) with dark black earth, granular



and mixed with small particles of decomposed bones, with charcoal distributed throughout from the size of a pea to that of a hen's egg; and from the smallest crevices and fissures in the sides of the cave, the bones of animals, birds, fish, land and marine shells, intermixed with pebbles and charcoal, have been extracted.

‘In the south-east angle (or near it) of the cave there is a stalagmite column fourteen feet high, attached to what little now remains of the roof, which, it would appear, has been destroyed unsuspectingly in the quarrying out of the rock. There have also been two stalagmite floors on the west side; the upper one, which runs round the south side, is eighteen feet, and the lower one twenty-two feet, below the roof of the cave. Ossiferous breccia, bones encrusted in stalagmite and in a fossil state, were found beneath these floors, and are still visible in the sides. The dark mould appears to have extended to the first floor; below this, for a short distance, is a red gravelly earth, and then black mould again, which becomes gradually coarser, mixed with broken stones, to the bottom. The ground-floor appears to be formed of large blocks covered with stalagmite, upon which the hammer and pick make but little impression. In order to ascertain what is beneath them it will be necessary to blast them out.

‘On July 13, 1863, a shaft was sunk by my directions through the stalagmite floor on the south side. On removing the upper crust (two feet thick), some large animal bones were found, and as the excavations proceeded, two more similar crusts were discovered, the intervening spaces between the three, being about three feet, were filled up with loose stones and earth: in these crusts and below them bone-breccia, fractured bones adhering to each other by stalagmite, and others in a hard red cement, were seen. On reaching a depth of ten feet it became evident that the shaft was leading into another cave or fissure, one side of which, of solid rock, was covered with stalactites and rock-breccia, and through some fissures a slight current of air could be distinctly felt ascending from below, which affected the flame of a lamp when applied to it. There was little earth to excavate at a depth of twelve feet, where there were large blocks of lime-



stone thrown on each other everywhere. These I directed to be broken up by means of wedges, being apprehensive that the use of gunpowder would shake the place too much. The tedious operation of breaking these blocks occupied many days, and, at length, when a large piece was broken off the last loose block, it suddenly gave way and disappeared down an aperture which had not been observed behind it. A prisoner descended this with a rope, and reported on his return that, below the aperture, there was an open passage descending perpendicularly for a considerable distance, and that the block which had fallen into it was partially choking it up, resting on a ledge a short way down; means were adopted which succeeded in dislodging this stone, and a rope ladder was procured, and when this was fixed I descended with a warder and some prisoners to examine the locality, and perceived that it descended perpendicularly for forty-five feet to a landing. Above this there is a roof thirty feet high. Another descent of seventeen feet, by a rope ladder, reaches a cave of some dimensions, which I have named "The Victoria Hall," and the descent to it "Saint George's Passage," the cave having been first discovered on St. George's Day.

'In the centre of the cave there are some large boulders, over which it is necessary to pass to reach a passage below them. This passage, which in some places is six feet high, leads to another perpendicular descent of twenty feet by a rope ladder, near the foot of which there is a small fissure descending to a passage running in a south-westerly direction. This was very narrow in some places and difficult to pass through, but Captain Arthur Hood, A.D.C., who accompanied me in my second descent, succeeded in passing to some distance, and returned with some bones of animals and shells. These passages have been since cleared from the clay and stones which obstructed them, and have been pushed on thirty-five feet in advance, terminating at the date of this Report in a vertical fissure from three to six feet wide, thirty-two feet deep, and thirty-two feet long. At the bottom of this fissure there is a bed of clay several feet in thickness, which was excavated, as there was every indication of its being con-

nected with other fissures or caverns below it. The sides of the fissures are covered with stalagmite, and in the passage leading to it the walls are covered with the most fantastic stalactite formations, some resembling small glass tubes, hollow, and transparent, about the size of the common quill, and from four to ten inches long.

‘*Embedded in the clay at the bottom of the fissure, animal vertebræ and bones, with those of birds and fish, have been found, together with marine shells, water-washed pebbles, bluish dark flints, and angular fragments of limestone rounded by attrition. About eight feet of the clay have been excavated, and at the lowest depth yet attained, 200 feet below the plateau of Windmill Hill (which is about 400 feet above the level of the sea), a fresh current of air can be felt ascending through fissures, sometimes strong enough to extinguish a lamp. The temperature here, at this date, at mid-day, is 66° Fahr., which is 12° cooler than at the surface, and small pools of water are found.*

‘*Human Remains.*—These were found lying in every imaginable direction and position, without order, to a depth of ten feet, or thereabouts. Scarcely a bone has been found whole, much less an entire skeleton. Some of the bones are partly decomposed, others have been gnawed by animals, many stained a bluish black. They were also found in a semi-fossil state encrusted in stalagmite, and in a red ochreous cement; charcoal was adhering to many of the bones. Some portions of human skulls were found even close under the roof of the cave.

‘*Animal Remains.*—The foregoing remarks respecting the position and state of the human remains are applicable to those belonging to animals, birds, fish, with the exception that these have been found down to the lowest depths yet attained. Charcoal was adhering to many, but this has not been observed in the lower caverns and fissures.

‘*Works of Art.*—The flint instruments, anklet, skewers or arrow-heads, &c., were also lying without order, as also the querns and “rubstones.” As regards the latter, I have compared them with the nearest sandstone procurable at Windmill Hill, which is at the “sandstone quarry,” near

the Governor's cottage at Europa, and find that the latter is of a much coarser and different description altogether.

'With respect to the pottery, only three entire earthen pots were found, and two of these were unfortunately fractured in digging them out; the one remaining entire (Fig. 4. Pl. VIII.) appeared to be filled with clay, on removing which a scallop shell was found at the bottom. This has probably been used as a lid, as it seems to fit the mouth exactly. One of the pots which I cemented was evidently never formed by the potter's wheel. Some of the fragments are rudely ornamented, and all unvarnished. Fragments of pottery were found at a depth of twenty feet from the roof. The greater portion was found on the south and west sides.

'*Land and Marine Shells.*—The former were continually found adhering to the sides of the cave as in life—others encrusted in stalagmite. Marine shells were found from the roof of the cave to the lowest depths, together with two pieces of coral.

'Rounded and water-washed pebbles, angular fragments of limestone rounded by attrition, bluish flints, portions of sandstone, were found everywhere; also a piece of plumbago, which has a small hole in it, as if it had been worked out by the finger.

'In concluding the foregoing observations, I would beg to observe that the satisfactory progress of the excavations is owing to the great interest which His Excellency the Governor has taken in the cave since its first discovery, in temporarily suspending works which if carried out would have destroyed it, or most effectually prevented its development; and I beg to return my best thanks to His Excellency for the kind and ready assistance I have always received from him since he was pleased to entrust me with the superintendence of the excavations.'

The Report from which the foregoing extracts are taken, brings the history of the exploration of the Genista Cave down to August 21, 1863. But the excavations were actively and uninterruptedly carried on, except when stopped by heavy rains, and in August, 1864, had reached a travelling distance, bearing south-west, of 380 feet from the mouth, and

to a vertical depth of 290 feet from the surface. The stalagmitic floor of the upper cave had been broken through in two places by shafts, and other ossiferous fissures had been traced in connection with it. The ground outside the east wall, referred to in the Report as 'an obstruction,' had also been extensively excavated, and had yielded important additions to the collections. Of these progressive steps Captain Brome communicated an account in numerous letters, in one of which, dated September 21, 1863, he wrote as follows:—

‘Since my Report, with plan and section, was forwarded through the Governor of Gibraltar on the 22nd ultimo, the excavations have been pushed on about 100 feet further, still bearing south-west, through passages which have been cleared, into another large fissure, the height of which is about eighty feet or upwards. In this, embedded in clay, fragments of bone, sea-shells, and small portions of charcoal have been found, which I presume must have been washed down from above. The ramifications extend about 300 feet (travelling distance), and the perpendicular depth below the plateau of Windmill Hill is, according to my calculation, about 290 feet. In fact, it would appear that the ramifications exceed those of the celebrated St. Michael’s Cave, which, according to Lieut. Warren, R.E., only extends 288 feet below the entrance gate of the cavern.’

In a letter dated February 25, 1864, Captain Brome states, that ‘the works are again going forward in the lower fissures, but during their temporary suspension from the wet weather, we have sunk a new shaft about ten yards behind the principal one, leading to the lower fissure and caverns, &c. On reaching a depth of eighteen feet through a stalagmite floor, an immense quantity of fractured bones, imbedded in breccia and a hard red earth, were found; and, at the depth already mentioned, we cleared out a chamber about ten feet square, in which were found the remains of a large pillar, seven feet in circumference and about nine feet high: it is not *in situ*, but inclining on one side, and attached to the roof by stalagmite. It appears as if it had slipped from a higher position, and was immediately surrounded by debris, &c., which had kept it in its upright position; there is a

crack running through its centre, which probably occurred when it was displaced. Immediately behind this pillar there was evidently a passage, but it was choked up so completely with loose stones cemented together with breccia, that it took the prisoners ten weeks to clear it to a depth of forty feet, when to my disappointment it was found to run into the lower caverns, with which it is connected by a very small passage. . . . The operations outside the east wall are going on very satisfactorily; I have made an excavation about 202 feet long, and 14 feet broad. On the east side of this excavation, extending along its whole length, is a large fissure or ravine (E, Pl. II.), with a dead wall of solid rock, over which the large broken masses of limestone lying in the fissure must have been precipitated. I have also observed that this opening appears to be in a line almost with a rugged ridge of rock which runs down the southern slope of the hill called *Pan de Assucar*, on which stand the remains of O'Hara's Tower. It is my impression that the ravine runs right across the plateau of Windmill Hill, and I intend to see if this is the case by excavating it, if I am not stopped. The ravine runs in a S.S.W. direction, and if you have a plan of this part of the rock, and can find *Jacob's Ladder*, which is a communication with the road leading to *Europa Flats*, that will be the spot where the end of the ravine must be, provided it continues in its present direction.'

In a letter dated July 31, 1864, Captain Brome writes as follows :—

'Since I last addressed Professor Busk, labour has been directed to open the vertical fissures, the discovery of which I then reported, a portion of which forms the eastern boundary of the upper cave. This fissure, which runs in a S.S.W. direction across Windmill Hill, has been opened to a distance of 350 feet, and in two places to depths of 50 and 64 feet. In the first a stone implement was found and masses of breccia with small bones and land-shells imbedded in them to a depth of fifty feet. In the second also the same appearances presented themselves to a depth of fifty-three feet; but here the prisoners came upon a mass of bones in a good state of preservation, not rolled or bearing any marks what-



ever on them. In this mass two teeth of rhinoceros were found.'

A second detailed Report of his subsequent operations, furnished to me by Captain Brome, is dated May 14, 1868, accompanied with additional plans and sections, which have been given on a reduced scale with this communication.

'The first Report' (1863), he says, 'left the prisoners excavating the clay at the bottom of fissure *m* (Pl. III.), which was done to a depth of twenty-one feet; here the sides of the fissure began to draw in, and no outlet was visible. Numerous bones and fragments of bone were found in the clay. After a careful search for an outlet, one was found at *o*, but it was closely choked with stones and earth, &c., which had to be excavated for a distance of forty feet, where it was found open, leading down into *q*, a large cavernous fissure about eighty feet high, with two clay beds at the bottom, which were excavated to depths of twenty and twenty-one feet; bones were found in this clay. The air in the fissure was quite pure, and the aneroid barometer marked a vertical depth of 248 feet from the original surface. After a careful examination of the place, no outlet was visible; some of the prisoners ascended the sides to a height of about fifty feet, but without success, and the men were withdrawn.

'The fissure *n* was the next new find, thirty-three feet in length, six feet in width, and forty feet in depth. The bed of clay in the bottom was excavated to a depth of twenty-seven feet, and bones, charcoal, &c., were found in it throughout. The sides at the bottom draw in, and no outlet appearing to exist here, the place was abandoned.

'Labour was now directed again to a careful exploration of the upper chamber. The stalagmite floor at *x* was pierced, and a descent made below it to a depth of twelve feet. Bones, broken stalactites, and breccia came up in abundance. A small chamber was excavated here, twelve feet by nine feet; and a portion of a large stalagmite pillar was found, standing almost upright. It had apparently come down from a higher position in some convulsion, and getting surrounded by debris, &c., swept in when it fell, was kept in the position in which it now stands. This portion of pillar is fourteen feet in girth, and eight feet high.



‘Near the pillar the remains of a passage were found, closely packed with hard breccia, bones, &c., and after being excavated to a considerable distance, it was found to run circuitously into E E. Another passage near the head of the rope-ladder was also excavated, and was found to run into the same place. Grey limestone was reached below the floor of the upper cave at a depth of twelve feet, which was rent in all directions. One of these fissures was just wide enough to admit a small man, who descended to a depth of twenty-four feet, but the spot was too narrow to work in.

‘The lowest floor on the west side of the upper chamber was next worked. The stalagmite being very hard, small charges of gunpowder were used to detach it: a portion was removed to a depth of six feet, down to grey limestone. Numerous bones, crusted with a white chalk-like substance, were found embedded in it.

‘On the south side of the upper chamber an excavation was made through three stalagmite floors, to a depth of nearly twenty feet, at which depth a bone needle with an eye in it (Fig. 1, Pl. XI.) was found.

‘Every part of the upper chamber and lower fissures having been carefully explored, my attention was directed to the discovery of the ramifications of the cave to the eastward, where I felt persuaded they extended. Not being allowed to interfere with the boundary wall, whose foundations came in the way, I directed an excavation to be made under the south-east angle of the wall, with the object of passing under it to the other side. As the excavation proceeded through what appeared to me to have been an entrance at some time, a sudden fall of earth from above made me apprehensive for the safety of the wall, and it was abandoned in consequence. A dry stone wall, however, was first built up, as shown in section A at B.

‘Labour was now directed to break ground outside and parallel to the east wall, at a distance of ten feet from it, commencing at the north end, near the road leading to the officers’ quarters on Windmill Hill. In a short time (a few days), a polished stone axe (Fig. 4, Pl. XII.) was found, similar to those found in the Swiss lakes. At a depth of nine feet

from the surface, a fissure was met varying from seven to eight feet in width, which was filled with red bone breccia, loose bones, &c. It was excavated to a depth of thirty feet. At this depth, the sides of the fissure bore evidence of much dislocation and disturbance. Immense masses of limestone were seen lying on each other in all directions; the lower masses were much shaken and cracked, as if the overlying ones had fallen on them from a height. A passage was excavated in this fissure to a distance of seventy feet, when further exploration was prevented by the sides contracting inwards. This passage was choked with earth, breccia, and loose stones, with water-washed pebbles intermixed, and it ran off in the direction of the upper chamber, with which it appeared to be connected. The works were here brought, however, to an untimely end by an intimation from the Commanding Officer of the Royal Engineers, who objected to further excavations on account of their proximity to the wall.

‘In no way discouraged, I determined to trace the course of the fissure more to the southward, where it was unlikely any objections would be made. After some weeks’ hard work, the continuation of the fissure was found leading in a south-westerly direction. It was a “sealed fissure” (if ever there was one), as there was not the slightest indication of its existence on the surface. Before reaching the fissure, the entire skeleton of a horse was found about two or three feet under the surface, dry, porous, and earthy, and though not at all incrusted, hardly distinguishable in appearance from many of the older fossilised bones, and in no way from those accompanying the human remains; but the feet had attached to them shoes of English make and fashion; and eventually these remains turned out to be those of a horse once the property of Captain Williamson, who was adjutant of the gallant 33rd regiment at Gibraltar in 1839.

‘As the excavations in the fissure proceeded, I observed that the sides of it bore evidence of great dislocation, vertically and horizontally. Its width varied from five to six feet, and no remains of any consequence appeared till a depth of twenty feet or thereabouts was reached; here red bone-

breccia and bones, flints, and rounded pebbles began to make their appearance. A considerable time, however, elapsed before this depth was attained, in consequence of our having to break up (piecemeal) the very large masses of limestone blocking up the fissure, and the use of gunpowder at this spot would have been dangerous to the buildings in the vicinity. Obstacles of this nature, it may be observed, were encountered throughout the entire excavations.

‘At a depth of fifty-three feet, the men came upon a quantity of red breccia with bones and teeth embedded in it; among the latter I identified two molars of *rhinoceros*. A human tooth was also here found in the red breccia, which is, I believe, the first instance of the kind on record of such remains being found in such a matrix; a flint knife was also found in this breccia, and numerous large pieces of flint. There is not the shadow of a doubt but that the foregoing objects were found in the red breccia, therefore I do not despair yet of hearing that further remains of man and his works have turned up in the same breccia.

‘The human tooth was identified by Professor Busk, who was of opinion that it was “a molar tooth which had never been cut.”’

The eastern fissure was subsequently opened to a considerable distance towards the south-west, and afforded in parts numerous fossil remains, but none apparently belonging to the human period. To what extent it reaches towards the south was not ascertained, but it probably traverses the entire length of Windmill Hill plateau. In a northerly direction, Captain Brome perceived indications, on the slope leading up to O’Hara’s Tower, on the east of the Jewish burial-ground, which led him to suspect that a continuation of the same fracture extended nearly to the summit of the ‘south hill,’ and the observations of Dr. Falconer and myself tended strongly to confirm this view. If this be really the case, the circumstance that the fissure and the Genista Cave, No. 1, which communicates with it, have afforded such an abundance of animal remains is at once accounted for by its being directly in the line in which the pluvial autumnal floods would pour from the higher ground down upon Wind-

mill Hill Flats, bringing with them the remains of the various animals which at that period inhabited the thickly wooded heights. In the course of the explorations it was clearly ascertained that the only entrance apparently into the upper Genista chambered cave was from the eastern fissure, below the angle of the boundary wall.

2. *Genista Cave, No. 2* (Pl. II. B, and Pl. IV.).

Encouraged by his success in the first discovered Genista Cave, Captain Brome resolved upon making a careful examination of its vicinity in the 'full expectation of finding other caverns on the hill;' nor was he 'disappointed in this hope,' for on November 1, 1864, he says, 'about a month after the departure of Messrs. Falconer and Busk, one was discovered.'

'On examining the ground between the large magazine on Windmill Hill and the West Cliff, I observed two small apertures, which led into a cavity nine feet deep. As appearances looked promising, I obtained the necessary sanction from the authorities, and commenced operations there on November 3, 1864.

'The place had never been explored, nor were there any indications that excavations had been made in it.

'On the removal of stones and earth, a small cavern was found, having the following dimensions :—

|        |   |   |   |   | Feet. |
|--------|---|---|---|---|-------|
| Height | . | . | . | . | 9     |
| Width  | . | . | . | . | 15    |
| Length | . | . | . | . | 30    |

'It had a stalagmite floor, which was opened in two places. Beneath this, and embedded in it, were found stone axes, flint knives, worked bone, &c. On reaching a depth of three feet a small opening was found, five feet to the eastward up the cavern. When this was sufficiently enlarged, a man crawled through, and on his return reported that the aperture led into passages which he thought extended about 100 feet, with a slight incline downwards; also that there was another aperture, through which, if enlarged, he could move still further. When the opening at the entrance was en-

larged, I went in to a distance of forty feet, which was as far as I could penetrate, and found that the passage was filled nearly to the roof with light black earth, so light in fact that, with the pressure of the hand almost, an iron rod could be pushed in easily to a depth of three feet and upwards. There was barely room for me to crawl between this earth and the roof. On removing the earth, which was a tedious operation through so narrow a passage, remains of various kinds were found in it. At a considerable distance in, the valve of a pecten was dug up, associated with human remains, consisting of some fragments of a skull and a human tooth (incisor). When the passages had been excavated to a distance of 110 feet, we came upon limestone, which prevented our continuing the work, which had occupied the prisoners about three months.

‘The remains yielded by this cave and the passages consisted of the following, viz.:

‘1. Human remains.

‘2. Animal remains of all kinds. These appeared to have belonged to ruminants only.

‘3. Bones of birds.

‘4. Bones of fish.

‘5. Sea and land shells.

‘6. Fragments of pottery of the same kind in every respect as that found in Genista Cave, No. 1.

‘7. A piece of sulphur.

‘8. Worked bone.

‘9. Stone axes; one was of a sea-green colour, with a square chisel at one end and a gouge at the other.

‘10. Flint knives.

‘11. Chipped flints.

‘12. Round, water-washed pebbles.

‘The remains presented precisely the same appearance as those found in the first cave, as regards being sun-cracked, *not* rolled or water washed, and very few with signs of having been gnawed. Everything almost was fragmentary, very few whole bones being met with.

‘The cave has its entrance at the surface, and is an inland cave. Its general bearings are N.N.E. The scattered, broken

state of everything found, together with the fact that the objects were almost invariably discovered near and under the sides of the cavern and passages, appears to me to indicate that these appearances could only have been caused by some convulsion, accompanied by flood.

‘No metal of any kind was found. The distance from the entrance to this cave from the first Genista Cave is exactly 1150 feet. The water-washed surface above is extremely rugged and wild, and not the slightest trace exists of any former pathway to it.’

### 3. *Genista Cave, No. 3* (Pl. II. E, and Pl. IV.).

‘This cave appears to me to have been a seaboard one. It is situated on the east side of Windmill Hill, about 150 feet from the cliff over the Governor’s cottage, and not far from the ruin of an old windmill. One of my sons was the first to draw my attention to this spot; he said that his dog had gone into a very small hole a considerable distance after a rabbit, where he could just hear his barking. I examined the place, and set the prisoners to work immediately to excavate it.

‘On clearing the entrance, and after removing two feet of surface matter, several bones of animals were found, and soon after fragments of a human skull, a few flint knives and flint chips; and the following day several portions of human remains were met with, viz. human skulls and bones, vertebræ, upper and lower jaws, and teeth. On the cave being partly cleared I measured its dimensions on the 11th January, eight days after its discovery, which appeared to be as follows, viz.

|                               |             |
|-------------------------------|-------------|
| Height . . . . .              | 9 ft. 6 in. |
| Breadth . . . . .             | 25 „        |
| Travelling distance . . . . . | 30 „        |

The sides of the cave bear evidence of much horizontal dislocation; and about the centre there was a small pillar, which was broken across near the roof,\* and the lower part displaced about five inches. This pillar was unfortunately subsequently destroyed by some mischievous person; but the

\* As shown at A in the Plan.  
K 2



warders and myself have a clear recollection of it. Four human skulls\* were found in this cave at about six feet under the surface—one I saw taken out myself; these were nearly perfect. Various fragments of skulls were found. The objects were, as in the other caves, nearly all fragmentary, more or less injured, and all found scattered in every direction round the sides of the caves. The following is a list of the remains found:

‘Four human skulls, nearly perfect, the only ones yet found in this state; human upper and lower jaws; numerous fragments of human skulls; human molars and incisors and portions of lower jaws; human vertebræ and other bones; bones of animals (apparently ruminants, goat, ox, ibex principally); bones of fish and birds; bone breccia; stone axes; flints and flint knives, chips, &c.; pottery, as usual in fragments, of the same kind as that from the other caves on Windmill Hill; worked bone; sea shells, barnacles, &c.; water-washed round pebbles, large and small.

‘The entrance to the cave is on the east side, and its general bearings run W. When it was entirely cleared out down to the stalagmite floor, this was broken through, and a perpendicular excavation was made, as at c in the Plan, which was afterwards connected with the cave on the west side. Here bones were found, and a great quantity of loose masses of limestone, &c. The excavation was pursued to a distance of eighty feet. After this, I considered the cave explored to the utmost, and abandoned it.’

#### 4. *Genista Cave*, No. 4 (Pl. II. D, and Pl. V.).

‘This is a seaboard cave, and has its entrance in the face of the east cliff (as shown in the sketch), nearly over the Governor’s stables at Europa, and about forty feet under the summit.

‘A rope-ladder was lowered down to the entrance, and the first object found was the skull of a large bird, probably a vulture. On commencing to excavate, flint knives and chips were dug up under the stalagmite floor. The cave has two passages, having a southerly direction, with a slight in-

\* Two of these, the most perfect, are represented in Plate VII. Figs. 1–8.

clination downwards; it appears to run almost parallel to the east face of the cliff; there are some short pillars in it, and the travelling distance reached is sixty feet. There were no human bones found here. The articles met with consisted of the following, viz.:

‘Flint knives or flakes; bones of animals, large and small; bones of birds, and of fish; the valve of a pecten; land and sea shells; large molar tooth of deer; teeth of carnivorous animals; water-washed pebbles.

‘Here, again, everything was found in the same disturbed state as in the other caves. The bones might have been carried into this cave by vultures; but the flint knives and chips, and probably the cervine tooth, were taken there by man.’

5. *East Fissure* (E, Pl. II.).

‘Having done all that could be done in this cave it was abandoned, and labour was resumed again at the east fissure.

‘It was my anxious wish to discover the whereabouts of this fissure’s connection with Genista Cave, No. 1. I directed what appeared to me to be a closed perpendicular rent, at the north end of the northern part of the fissure, to be opened. It was just large enough for the prisoners to work in, and was excavated in a northerly direction for a distance of fifty-four feet. Quantities of red bone-breccia were here found; but the work came to an untimely end, a notification having been forwarded to me by the Commandant of the Royal Engineers, that we were undermining the new wall: the work was in consequence suspended for some weeks, as stated above.

‘In the meantime I wrote to the Commanding Engineer, requesting him to be good enough to allow an officer to inspect the excavation, and report thereon for his information, as it would have been a great pity to arrest the progress of the exploration at this point. An engineer officer was accordingly sent to examine the place, who reporting that the excavations would not affect the wall in any way, Colonel Ayre kindly gave permission to proceed, and in a very short time afterwards the prisoners broke through from the excavation into B (vide section A, Pl. III.), the spot I had built up, and where I always suspected an entrance to exist.

‘The excavations now proceeded at the north end at the bottom of the fissure, and here, embedded in red breccia, a large jawbone of a horse was found, which was taken to England for identification. Below the spot, nearly where this was found, at a depth of sixty feet, an aperture was discovered, which on being enlarged was found to lead through very narrow fissures by a circuitous route down into Q, the lowest fissure-chamber. Thus two entrances were now discovered, which clearly indicated how the remains found at the lowest depths reached that position.’

#### 6. *Martin's Cave* (2, Pl. II.).

‘Feeling persuaded that if the well-known caves on the rock were properly explored, they would yield interesting relics of the past, I addressed an official communication on the subject to his Excellency Lieut.-General Sir Richard Airey, G.C.B., Governor of Gibraltar, requesting permission to explore St. Michael's, Martin's, Fig-Tree, and Poca Roca Caves, and having received the necessary sanction, proceeded to Martin's Cave on June 20, 1867, with a party of ten picked men.

‘On examining the condition of the cave, no traces were visible of any vigorous exploration ever having taken place, either in the bed of dark earth, or through the stalagmite floors.

‘The cave is a seaboard one, situated on the east side of the rock, about 590 feet above the sea level. It bears the name of the soldier by whom it is said to have been discovered about the year 1821. I could find no inscription of earlier date than 1822. On its first discovery, I am informed that it was almost inaccessible, and the present approach and iron gate were made by the Royal Engineers. As usual, in these cases, there is a rapid descent from the entrance (which is five feet wide), and the floor is covered with black earth.

‘I directed the prisoners to excavate the black earth all along and under the north side of the cavern, and to have it carefully searched. After a couple of hours' work, two flint knives were found two feet under the surface, and

before the prisoners left seven more were discovered. Day after day flint knives, stone axes, fragments of pottery, were found, the latter the same as those at Windmill Hill in every respect, as regards material, appearance of fracture, &c. A party was also set to excavate under the south side, where the same objects were found. Five days after the excavations commenced, a two-edged sword was found under six feet of earth, in a small chamber on the north side, at the lower end of the cavern; it was partly under stalagmite, and was fractured in five or six places; its dimensions are as follows, viz.:

| HILT :—                                           |  | Feet. | Inches. |
|---------------------------------------------------|--|-------|---------|
| Length . . . . .                                  |  | 0     | 6½      |
| Circumference of grasp at thickest part . . . . . |  | 0     | 5       |
| BLADE :—                                          |  |       |         |
| Length . . . . .                                  |  | 2     | 11      |
| Greatest breadth . . . . .                        |  | 0     | 2½      |
| Narrowest breadth . . . . .                       |  | 0     | 1¾      |
| Centre thickness of blade . . . . .               |  | 0     | 0¼      |

‘The hilt was surmounted by a globular pommel, and the whole of this portion of the sword appeared to be of silver.

‘The scabbard had been of leather, lined (apparently) with wood; it was mounted with silver.\* On the silver mounting at the mouth of the scabbard there was a stamped ornament.

‘The day following that on which this sword was found, another was discovered, or rather the remains of one. It was found at about the same depth as the other, but about four yards distant from it. The hilt is of the same form as the first, with a globular pommel; it is of iron, and the mountings of the scabbard of copper. It was found fractured in seven places, and was of the following dimensions, viz.:

| HILT :—                             |  | Feet. | Inches. |
|-------------------------------------|--|-------|---------|
| Length . . . . .                    |  | 0     | 6¼      |
| Circumference of grasp . . . . .    |  | 0     | 5       |
| BLADE :—                            |  |       |         |
| Length . . . . .                    |  | 3     | 2       |
| Greatest breadth . . . . .          |  | 0     | 2½      |
| Narrowest breadth . . . . .         |  | 0     | 1¾      |
| Centre thickness of blade . . . . . |  | 0     | 0¼      |

\* Mr. Franks thinks it is more probably tin, but it certainly looks very like silver.

‘The above sword was not in so good a state of preservation as the former one.

‘A short time after the discovery of the swords, a copper plate was found under eighteen inches of hard stalagmite, close under the south side of the cave. When it was brought to me it was covered with verdigris. It is about one and a half inch long, with a circular hole stamped or punched through each corner. Some of my friends thought it was a portion of some military appointments of the present period. I removed the incrustations as carefully as possible, and something very white appeared. In a short time an enamelled surface was visible, having depicted on it something like a bird in the coils of a serpent, which has been identified by Mr. Augustus Franks as a dragon. The plate is said to be of “Limoges” work, and of the same period as the swords.\* The colours on this plaque are still visible, and must have been very brilliant.

‘The remains collected from this cave were as follows, viz.:

‘Human remains; animal remains (ox, chiefly, goat, sheep, ibex); bones of birds; bones of fish; bones of reptiles; fragments of pottery; sandstone querns, made of a material not to be found at Gibraltar, nor in the neighbourhood; stone axes; flint knives, numerous; one beautiful specimen of a flint core; worked bones; sea and land shells; round pebbles; rubstones of sandstone; charcoal, distributed above and below the stalagmite floors.

‘At a depth of five feet below the black earth a stalagmite floor was found and broken through, beneath which, and embedded in it, were found the bones of animals, birds, fish, charcoal and pottery, sea shells (limpets principally).

‘The dimensions of Martin’s Cave are as follows, viz.:

|                                        | Feet. | In. |
|----------------------------------------|-------|-----|
| Extreme length from entrance . . . . . | 114   | 0   |
| Greatest breadth . . . . .             | 73    | 2   |

‘Martin’s Cave having been now pretty vigorously explored, and no new outlets from it in any direction discovered, the party were withdrawn.’

\* Probably of the end of the 12th or beginning of the 13th century, according to Mr. Franks.

### 7. *Figtree Cave* (Pl. 3, II.).

‘The cave thus named was the next explored. As it had no name before, I gave it the above, temporarily, from the fact of its having a Figtree growing out of the rocks above its entrance. It is a seaboard cave, situated not far from Martin’s Cave, but about 200 feet higher up. There is no regular path to it, but from the polished state of the stalagmite at the entrance it has evidently been much used at some time.

‘The following are the dimensions of this cave, viz.:

|                             | Feet. |
|-----------------------------|-------|
| Length . . . . .            | 58    |
| Breadth at centre . . . . . | 14    |
| Average height . . . . .    | 24    |
| Width of entrance . . . . . | 17    |

‘The exploration of Figtree Cave was commenced on July 21, 1867, and the excavations were begun all round the sides. In a short time the men came upon human and animal remains, fragments of hand-made pottery, &c.; the work proceeded through two stalagmite floors down to a depth of five feet, where we came upon the gray limestone. The cave is an extremely dry one, and the bed of earth in it is nothing but dust. There were no traces of any exploration through the earth or stalagmite floors. There is another cavern, smaller and lower, running nearly parallel to this; and they both seem to meet at the ends, which are too contracted to allow one to pass through; but here no remains were found.

‘The remains found consisted of—

‘Human remains; animal remains; birds’ remains; fish remains; flint knives and chips; fragments of home-made pottery; sea shells; charcoal.

‘A fragment of a very regular moulding, made of pottery, was here found, pointing to a comparatively advanced stage of ceramic art. The party were now withdrawn to explore the far-famed cave of St. Michael’s.’

### 8. *St. Michael’s Cave* (Pl. 1, II., and Pl. VI.).

‘The following extract from the report of Professors Busk and Falconer, prepared for the meeting of the British Association at Bath, 1864, will best explain the features of this remarkable cavern, viz.:



‘It is situated high up, but below the summit, at about 1,100 feet above the sea, and nearly equidistant from “Signal Station” on Middle Hill and “Sugar Loaf.” The entrance is contracted, being about five feet wide, leading by a rapid slope of in-fallen or in-thrown earth to a spacious hall, 200 feet long by sixty feet high, the roof of which is, as it were, supported by massive stalactite pillars, like a Gothic cathedral. This outer chamber conducts to a long series of caves, of difficult access, by a steep or vertical descent. The fissure has been explored to a perpendicular depth of about 300 feet, without reaching the end of it. The most conflicting statements have been made whether fossil bones do or do not occur in this cave, &c.’

‘After a careful examination of the upper chamber of the cavern, I could discover no traces of anything like vigorous exploration having been attempted, either in the black earth or through the stalagmite floors. Nearly at the extreme end of the upper chamber, traces of blasting are indeed visible; but this appears to have been done merely for the purpose of procuring the crystalline material locally termed “congeal,” which is used for the manufacture of various articles. The main explorations of St. Michael’s Cave have been almost solely confined hitherto to that of the lower ramifications, with a view to discover their extent. Many and most praiseworthy attempts in this direction have been made; and amongst those whose names are most worthy of record as explorers of late times may be mentioned those of the late Dr. Litle, R.N., and his commander Captain Risk, R.N., in 1844; Sir George Douglas, Bart., in 1847; Lieut. Warren, R.E., the late Captain Goodall, and Lieut. Brown, R.A., in 1865, who appears to have penetrated to the greatest depth hitherto reached. The animal remains, however, collected by these numerous explorers, have been very few, and were merely recent bones apparently washed in by the rains with the surface soil. Lieut. Warren, R.E., a most accomplished officer, since so distinguished by his researches in Jerusalem, carefully explored the lower series of caves and ramifications on several occasions. In a note to me on this subject, he says:

“The bottom of the cave is 288 feet below the entrance of the gate.

“I found no bones, shells, or osseous breccia in the cave; a little recent matter washed in by the rains was all that was to be seen.”

‘Lieut. Warren informed me also that he “obtained the depth accurately, both by measurement and with the aneroid barometer.”

‘The upper chamber, from the entrance gate to the front of the rapid slope, has a bed of black earth of various thicknesses. Along the north side, an immense number of limestone boulders and small stones were lying as if they had been thrown there to get rid of them, perhaps when clearing the cave. On the right hand side, at a distance of seventy-three feet from the entrance gate, is seen the well-known aperture through which so many explorers have passed on their way to the lower caves. In front of this aperture my first excavations commenced, where, after a few hours’ work, a human molar tooth and clavicle, with some fragments of the usual pottery, were found. As the excavations were continued all along the south side, through two or three stalagmite floors, abundant remains came up—human and animal bones, pottery, flint knives, &c. On concluding the exploration on the south side, labour was directed to the north side. The vast number of stones there which had to be first removed occupied some weeks; at length earth was reached, which had been covered by the loose stones to a depth of at least five feet. As the exploration went forward, the same results attended it as on the south side as regards the objects found.

‘At the lower end of the north side, after removing nearly seven feet of earth and stones, my attention was drawn to a small hole in a stalagmite wall, through which could be felt a strong current of air. I had the opening enlarged, and a cluster of stumpy pillars became visible. Several objects, including human and animal remains, were found near this, including a stone axe, the remains of an anklet of shell, all behind, between, and under stalagmite. The party working at the aperture were ordered to follow the current of air,

and, after a fortnight's hard work here, the men broke into a passage filled with earth nearly to the roof, which was of rock coated with stalagmite. There was no room for a man to enter here, so one of my young sons crawled in with a lantern to some distance, and on his return said that the passage seemed to continue downwards. He could just see over the earth, and that was all. I had the passage enlarged, and one of my warders, a man of spare dimensions, got through. He described to me that he passed through some passages, which terminated in a large cavern on the left hand; that his measurement of the full distance travelled was 200 feet; that after searching for about twenty-five feet, he found all the other passages and cave clear and nearly free from obstructions; he said the whole thing was so beautiful that it was out of his power to describe it.

'The following day, the aperture having been sufficiently enlarged to admit me, I went down. I found there was a passage from the entrance with a rapid incline downwards, which led into another about eighteen feet long; then passing through an opening between some stalagmite pillars, we got into a long open passage, averaging in width about fourteen or fifteen feet, and about twenty feet high. At the end of this passage there was a small hole on the left hand about five feet high, on going through which another passage was entered about forty-five feet long. The roof here is low, and it was necessary to stoop a little. At the end of this passage an opening which we broke through led into the cave No. 1, the dimensions of which are as follows:

|                 |   |   |   |   |   |   |       |
|-----------------|---|---|---|---|---|---|-------|
|                 |   |   |   |   |   |   | Feet. |
| Height .        | . | . | . | . | . | . | 25    |
| Length .        | . | . | . | . | . | . | 106   |
| Breadth .       | . | . | . | . | . | . | 44    |
| Bearings N.N.W. |   |   |   |   |   |   |       |

'Nothing can exceed the beauty of the stalactite formations in the cave and passages; they form clusters of almost every imaginable shape—statuettes, pillars, capitals, foliage, and figures; and, by the concurrent testimony of all who have visited these newly-discovered caverns, it would seem that their beauty is almost unrivalled. Even the

numerous Americans who have entered have been compelled to acknowledge that, as regards beauty and picturesqueness, neither the celebrated "Mammoth Cave" in Kentucky, nor any other in their country, could come near them.

'On reaching the first new cave, I immediately set to work to seek for outlets, air-holes, &c. We found at the top of the ascent, on the west side of the cave, a vertical fissure varying from six to ten inches wide. I observed that one side of this fissure was covered by a thick coat of stalagmite, the other being solid limestone. I had the stalagmite removed, as being the easiest way to enlarge the fissure, and in a few days a very slim prisoner managed to get through with some difficulty. He was absent a considerable time, and told me on his return such a wonderful story of what he had seen, that, in order to satisfy myself of the truth, the following day I sent in one of my little boys (about twelve years of age) with the same man. The boy being absent nearly two hours, nothing can describe my agitation, and the anger I felt with myself for sending him in. The moments were those of torment, but, happily, out he came, corroborating all the prisoner had stated.

'Additional labour was now directed to the enlargement of the vertical fissure, to enable me to go in; this occupied three weeks' hard labour, the men lying on their backs in water, but working with that energy, spirit, and good feeling which British soldiers always exhibit when there is anything extra to be done. On September 2, 1867, the fissure was reported to be large enough for me to enter, when, after two or three attempts without success, I made a triumphal entry, accompanied by Dr. James, R.A. On our getting through the fissure, which is about four yards long, by a slight ascent we entered a long passage, with a large cavernous hollow branching off to the left; we then came to a very steep descent, which led into cave No. 2. There was evidence of great disturbance here; large blocks of limestone had fallen from the roof, most of which were covered with stalactites of all sizes. Halfway between the entrance to the passage and the extreme end there is a descent of fifty feet, about



9. *Poca Roca Cave* (Pl. II. 8).

‘A few weeks before the prisoners were withdrawn from the caves, I went with a party to explore Poca Roca Cave.

‘This cave is situated at the north end of the rock, at an elevation of 689 feet above the level of the sea. It is a large cave with a very deep slope from the entrance. The exact measurements had not been taken when the order came for the withdrawal of the prisoners. What I particularly remarked was that it was filled with a light-brown silicious sand, which I had not met with in any of the other caves. It appears to extend a considerable distance under the rocks, and it was excavated in a horizontal direction to a distance of forty feet. In the sand were found bones of animals, &c., and several of these were found under a stalagmite floor. Some of the same kind of pottery was found here also as in the other caves. It has occurred to me that probably this cave may have some connection with the sand hills above Catalan Bay, as the sand is of similar kind.

‘This cave was fitted up or prepared, it is said, for the Governor of Gibraltar during the siege, but was not used by him. There are evidences of blasting operations having been performed, which appears to me to have been done to raise the roof of the passages. No traces of exploration (*i.e.* below the floors or earth) are apparent.’

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‘During the exploration of Poca Roca Cave, the excavations at St. Michael’s still continued. Another small cave, No. 5, was found, near the spot where the first aperture was discovered, which led to No. 1. It is a small cave, twenty-five feet by eighteen feet. The floor has not yet been broken through.

‘The remains collected at St. Michael’s Cave consisted of the following, viz.:

‘Human remains of all kinds, embedded in stalagmite or under it, and loose in the earth; remains of mammals, birds, fish, and reptiles; numerous fragments of pottery, hand-made, like that found in the Genista caves; fragments of



armlets or anklets; worked bone needles; querns; rub-stones; moulding of pottery, similar to that found in Figtree Cave; stone axes; flint knives and chips; eleven Roman coins near surface in earth; sea and land shell, numerous, of all kinds; some red bricks of unusually large size, in the earth.'

#### 10. *The Judge's Cave* (Pl. II. 7).

This cavern, sometimes also termed the Glen Rocky Cave, which has received its appellation from its being situated under the house and garden of Sir James Cochrane, the present chief justice of Gibraltar, is situated at a level of between 200 and 300 feet below the Windmill Hill Flats, in one of the numerous large ravines which, as before noticed, exist in the southern and western sides of the promontory.

More than twenty years ago Sir James Cochrane discovered in his own garden, under a considerable thickness of soil, the entrance into a vertical fissure, which, after descending to a depth of about forty feet, ended in a wide cavern, from which several narrow passages appeared to lead in various directions. One of these passages which opened into the wide chamber, at a height of about six feet from its floor, was entered and found to run to a length of about twenty feet, where it terminated in a second cavernous chamber. It was close to the termination of this passage in the second chamber that Sir James Cochrane came upon the remains I am about to describe, and which were brought to England in the year 1864 by Captain Sayers, the police magistrate and well-known historian of Gibraltar. It would appear that since the cavern was first partially explored by the learned judge, it has been but very rarely visited; and on this account it became an object of great interest to Dr. Falconer and myself on our visit to Gibraltar to inspect such an interesting locality, which from the account we had received of it promised to yield important results.

In this, however, we were disappointed, since, on our visit to it, in which we were most zealously and kindly assisted by General Frome and several other officers of the garrison, the not very easy or agreeable descent into its depths was not rewarded by the discovery of more than a few scattered bones.

The entrance through which the exploring party passed, and which was too narrow to admit without considerable difficulty the person of Dr. Falconer, is placed immediately under the doorstep of Sir James Cochrane's house, and it consisted of a narrow vertical shaft, down which the descent was made, partly by means of a rope and partly in the manner of chimney sweeps, by placing the back against one side and the feet on the other. This vertical shaft ended in the large vaulted chamber which had been originally entered by Sir James.

The floor of this chamber was tolerably level, and covered with fine soft sand, upon which irregular, angular blocks of limestone were scattered. On one side, at a height as before said of about six feet above the level of the floor, was a narrow chink or opening which formed the commencement of a contracted and very irregular passage, at the end of which was a second wide chamber, from which again passages of various dimensions proceeded in different directions. One or two of these were entered, and one, which descended at a rapid inclination, terminated abruptly at the edge of a steep vertical precipice that formed one side of a very large and apparently profound hollow. By means of a rope several engineers, officers, and men descended into this gulf, and found bottom at a considerable depth. Unwilling myself to risk the chance of a difficult ascent had I gone down, I requested the party to search in every direction for animal or other remains. But none were there met with. The only relics of animal life, as I have said, lay scattered about the termination of the first narrow passage.

The most diligent search disclosed no other entrance into the cavern than that already mentioned, although it was evident that in many parts the roof could not be far below the vegetable soil, as we observed numerous roots of trees, some of enormous length, depending from it.

It remains consequently a curious question relatively to the Judge's Cave, as to the way by which human beings and animals had formerly gained access to its interior. The only external entrance at present disclosed is that which I have described, which is extremely narrow, quite vertical,

and until the house was built and garden laid out, covered with a considerable thickness of soil. It should be remarked also, that no remains appear to have been met with in the first large chamber, all having been found at the end of the internal passage, which is so much constricted as with difficulty to allow of a man's creeping through it at full length, and whose entrance, moreover, is so high above the floor of the first cavern as to render something in the shape of a ladder necessary to reach it.

It is difficult to account for the position in which the human remains occurred, unaccompanied as they were, so far as we could learn, with any relics of works of art or of domestic animals, or any vestiges even of charcoal, except upon the supposition that they belonged to individuals who had sought shelter on a sudden emergency in the more secret recesses of the cavern, and there perished.

As no record seems to exist of the exact number of the human bones met with, it is impossible to conjecture how many individuals they may have belonged to, or whether all the bones of the different skeletons were there.

The bones we had an opportunity of examining, through the kindness of Sir James Cochrane and Captain Sayers, comprise—(1), a nearly perfect cranium; (2), a lower jaw belonging to another individual; (3), several *tibiæ*, all more or less presenting the platymeric character; (4), one nearly entire, and portions of a second *fibula* of the same type, but belonging to different individuals; (5), a nearly entire male *os innominatum*; (6), some *vertebræ*, portion of a *sacrum*, &c.

Most of these bones, but not all of them, were more or less covered with a hard greyish argillaceo-calcareous concretion, containing numerous shells of *Helix*, *Bulinus decollatus*, &c. Whilst others were merely coated with a uniform crystalline deposit of carbonate of lime, having, however, the same grey colour as the indurated calcareous mud of which the more massive matrix was formed.

The cranium especially and one of the *tibiæ* were imbedded in a very thick and solid mass of this substance. But the matrix, notwithstanding its hardness and great thickness, was easily detached from the bones, whose surface was left

smooth and entire, and to all appearance remarkably little different in consistence from moderately recent bone. The colour of the bone is a pale yellowish brown.

In fact, when the skull was freed from its covering it appeared quite fresh and more like a well macerated and carefully prepared bone, than one which had lain so long in the bowels of the earth. It contains abundance of animal matter.

The cranium is nearly perfect, and with the exception of a crack above the right squamosal suture, and on that side of the skull which probably lay uppermost, and of a fracture, and the absence of part of the right zygoma—wholly uninjured.

The most important deficiency is that of the lower jaw, the one accompanying it evidently having had another owner.

The conformation of this cranium is altogether different from that of the more perfect crania found in the Genista Cave, No. 3, as will be seen at once from the figures of it given in Plate VII. Figs 9, 10, 11, and would have been rendered perhaps still more evident had there been room in the plate to admit of a side view as well.

Fig. 11, however, shows that the Judge's Cave cranium is much lower than either of the others on each side of it, and figure 9 that the alveolar border is more prominent, and the zygomatic arches rather wider.

From its size and general aspect, it may be judged to be that either of a female or perhaps of a small male, at an age when the third molars are fully cut but quite unworn. The remaining teeth are the three molars on each side, the first and second of which are worn flat and smooth in the usual ancient and savage way; and the sockets of the other teeth, from their perfect condition and regularity, show that the individual had been in full possession of an 'excellent set of teeth.'

The skull is perfectly symmetrical, brachycephalic (792)—slightly prognathous, but with vertical teeth—aphanozygous.\*

\* The photograph, from the distance at which it was taken, gives more of the zygomata and alveolar border than is seen when the skull is held at arm's length

The forehead is well arched, and the supra-orbital border slightly elevated. The orbits rather square, and the nasal opening elongated and pyriform. The sutures are all open and much serrated, and on the right side there is a rather large Wormian bone. The following are the principal dimensions :—

|                                      |      |
|--------------------------------------|------|
| 1. Length . . . . .                  | 6·9  |
| 2. Breadth . . . . .                 | 5·4  |
| 3. Height . . . . .                  | 5·4  |
| 4. Least frontal width . . . . .     | 3·7  |
| 5. Greatest frontal width . . . . .  | 4·4  |
| 6. Parietal width . . . . .          | 5·1  |
| 7. Occipital width . . . . .         | 4·2  |
| 8. Zygomatic . . . . .               | 4·9  |
| 9. Frontal radius . . . . .          | 4·5  |
| 10. Vertical radius . . . . .        | 4·6  |
| 11. Parietal radius . . . . .        | 4·7  |
| 12. Occipital radius . . . . .       | 4·2  |
| 13. Maxillary radius . . . . .       | 3·5  |
| 14. Fronto-nasal radius . . . . .    | 3·55 |
| 15. Circumference . . . . .          | 19·5 |
| 16. Longitudinal arc . . . . .       | 13·8 |
| 17. Frontal transverse arc . . . . . | 11·8 |
| 18. Parietal „ „ . . . . .           | 12·2 |
| 19. Occipital „ „ . . . . .          | 11·2 |

The lower jaw which accompanied the skull is that of a much older individual of larger stature. It presents no special character requiring remark, except that the angle is everted and the chin well formed. The teeth are all much worn but quite sound.

Encrusted with a precisely similar matrix, and when uncovered presenting exactly the same appearance as regards colour and consistence, was a tibia of a highly platynemic conformation. The condition of the bone itself, and the nature of the matrix, would seem to justify the conclusion that this bone belonged to the same individual as the cranium, and we are thus enabled to obtain a glimpse, as it were, of the cranial form of some of the platynemic people.

Besides the human bones, the collection from the ‘Judge’s Cave’ includes those of several species of ruminants, some of

and viewed with one eye, which is the position I assume in speaking of the prognathous or phenozygous aspect or the reverse.

which are apparently in much the same condition as the human, whilst others are evidently more fossilised, and belong in all probability to a different epoch. The bones which in their condition most closely resemble those of man belong to a species of *Ibex*. The principal remains of this animal, are an old and a young mandible and a perfect tibia, which, though slightly covered with a crystalline deposit in one part, is otherwise wonderfully fresh and recent in appearance. Those bones, which from their more fossilised condition would seem to belong more properly to the true ancient bone breccia period, are those of *Cervus elephas* (var. *barbarus*). These are mostly cannon bones, and exhibit the same fine fissuring or crushing which is so frequently to be seen in the bones embedded in the ancient red breccia, from the deeper parts of the Genista—and other fissures in the rock.

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### CHAPTER III.

#### REMARKS ON THE HUMAN REMAINS, ETC. FOUND IN THE GIBRALTAR CAVES.

IN conclusion, I have to offer some remarks upon the remains of man and his works, which have been disclosed by Captain Brome's labours, previously to which the very existence of such relics on the Rock of Gibraltar had, so far as I know, except in the instance of the 'Judge's Cave,' not been suspected.

What I have to say applies more particularly to the remains found in the Genista Caves, whose contents have been the most abundant and varied, and will afford a perfect illustration of the nature of the contents of the other caverns.

1. *Genista Cave, No. 1.*—The human remains found in the first discovered cave on the Windmill Hill, together with the implements of bone and stone, articles of earthenware, and certain of the mammalian, fish, and bird bones, as well as the greater part of the marine shells, were all contained in the highest part of the cave, and principally above the uppermost of the several stalagmite floors noticed in Captain Brome's account of the cavern.



The space thus occupied varied in depth from the roof to the floor, from fourteen to eighteen feet, and the greatest depth in it, at which human remains were met with, was little more than ten feet. The greatest depth marked on any of the fragments, and these are few in number, is eleven feet.\* It is obvious, therefore, that the floor of this cavern had been covered to some depth with a deposit before any human remains had gained admission into it. It would further appear from several indications, that this lower material was different in character from that with which the upper portion of the cave was entirely filled. Some of the human bones, as stated in the Report, were encrusted in stalagmite, and embedded in a red ochreous cement; and this statement is confirmed by the appearance of many of the osseous fragments which are covered with a very thin, red, calcareous, crystalline crust, and have some red ochreous cave earth adhering to them, but which for the most part is readily washed away. But upon referring to the depths marked on the fragments so distinguished, they all appear to have come from the lowermost part of the upper chamber, that is to say, from a depth of eleven or twelve feet. It may, therefore, be concluded that these fragments, which in other respects also appear (or at any rate many of them) to be more fossilised than the great bulk of the human bones, represent the oldest, or the earliest which had gained admission into the cavern, and which from their position had been more exposed to the infiltration of water in the rainy season, which would naturally lodge longer in that part of the cave than at a higher level. With these exceptions, the human and other bones associated with them in the upper cave were not

\* It should be remarked, however, that as regards the occurrence of the human remains only above the stalagmite floor, a very large quantity of human remains, and of the different species of animals usually found in association with them, was met with in the 'Pillar Chamber' (shown in Plate III., to the left of the upper portion of the Genista Cave), as it is stated, below a stalagmite floor. But this floor appeared, in all probability, to have been deficient at one part where the remains were discovered lodged in dark earth. It should also be mentioned that a human molar tooth—the third lower molar in germ—was found at a considerable depth in the eastern fissure, and, as Captain Brome satisfied himself, beneath the level at which some rhinoceros remains had been discovered. But in a vertical fissure, the descent to any depth of such a small object is not much to be wondered at.

covered with any calcareous deposit, and but slightly infiltrated with mineral matter. They are, for the most part, dry and friable, adherent to the tongue, and have attached to them and contained in their hollows a blackish or cinereous mould-like earth, copiously intermixed with small fragments of charcoal.

As regards the chemical condition of the bones, all that can be stated is, that it appears to differ very considerably in different specimens. Although all contain enough animal matter to render them black when burnt, the quantity of that constituent is very much below the natural standard of recent bone. The results of numerous experiments showed that the animal matter varies in amount from about six to about twelve per cent., whilst that of carbonate of lime is increased to twenty or thirty per cent. of the dried bone, or at least double the standard in recent bone, that salt, as is usual, appearing to replace in part the animal matter removed.

Most of the mammalian bones immediately associated with those of man in the Genista Cave present precisely the same general characters, and differ notably in this respect from the older, more fossilised bones in the red breccia from beneath the stalagmite floors, and in the deeper parts of the cavern and fissures connected with it.

The mammals thus bearing intrinsic evidence of their close association with man are:—

1. *Bos taurus*, of various sizes.
2. *Capra hircus*.
3. *Capra ibex*.
4. *Sus scrofa*.
5. *Mus rattus* (?)
6. *Arvicola* : Sp.
7. *Lepus timidus*.
8. *Lepus cuniculus*.
9. *Meles taxus*.
10. *Canis vulpes*.
11. *Phocæna* : (Sp. ?).

To which may be added, from Genista Cave No. 2, a species of

12. *Herpestes* (?).

Together with these are numerous bones of fish, amongst which those of the Tunny are the most prominent; and of several birds, amongst which are species of duck or goose, hawks, and smaller forms. Amongst these remains, and indubitably belonging to the human period, are also to be included numerous marine shell-fish, belonging to the genera *Murex*, *Buccinum*, *Patella*, *Cardium*, *Mytilus*, *Pecten*, &c., all apparently of edible kinds; and, together with these, numerous land shells of the common existing forms, of which it may be supposed that some, at any rate, as *Helix pomatia*, might have formed part of the diet of the prisca race. The remains of articles of earthenware were extremely abundant, although for the most part in a very fragmentary condition. Amongst them, however, there were found in the Genista Cave several perfect or nearly perfect small vessels, of which figures half the original size are given in Plate X. Figs. 1, 2, 3. Within fig. 1 was found a large scallop shell, which from its size and form might, as supposed by Captain Brome, have formed a lid to the little pot. A very cursory inspection suffices to show that the pottery to which these fragments belong differs very widely in make, material, form, and ornamentation.

A large portion of the fragments show that the articles were made by hand, and without the use of the wheel; and these are also composed of a very coarse and imperfectly burnt dark or black clay, reddened however to a slight depth. Of this kind are the vessels and fragments shown on Plate X., except fig. 8, which appears to have been made on the wheel, whilst in Plate XI. are fragments of vessels, most of which have probably also been made with the aid of that implement, but are yet ornamented in the same rude fashion. The articles which have been so fashioned are also composed for the most part of a finer and more carefully prepared material, and they also appear to have been more thoroughly burnt. Some among them, as figs. 3 and 5, must have formed portions of considerable sized jars, of a not inelegant form. Belonging apparently to the same stage of ceramic art is the fragment represented in fig. 1 on the same plate, which is taken (half size) from one amongst numerous instances of similar kind in the collection from St.

Michael's Cave. The figure gives three views of the perforated spout of a drinking vessel. No instances of the same sort occurred in the Genista Cave, and no vessel with the same kind of spout is, so far as could be ascertained by the most careful inquiry by Captain Brome and the Roman Catholic Bishop of Gibraltar, at present made use of by the inhabitants of the neighbouring country, nor by the Moors on the opposite coast; nor in my limited experience of such things have I noticed vessels of similar construction figured in any work, except quite recently in the '*Antigüedades prehistoricas de Andalucia*' of Don Manuel de Góngora y Martinez, in which (p. 45, fig. 47) a precisely similar perforated spout, *extraño piton*, as he terms it, is represented. The drawing might have been made from many of the specimens discovered by Captain Brome in St. Michael's Cave. In the British Museum there is an earthenware vessel with a very similar<sup>e</sup> spout from Peru.

Although, as I have said, drinking vessels of this kind are not known to be now in use in the south of Spain, nor in Morocco, it would seem that they are still made and used by the Kabyles in Algeria; and through the kindness of Sir John Lubbock I am in possession of a sort of jug with a long perforated spout, evidently intended for the same purpose, which he has recently procured, together with other earthenware objects, from that country.\*

Other fragments again, composed of a fine, well-burnt material, of bright red colour, with smooth surface, and evidently skilfully made on the potter's wheel, denote the existence in the Genista Cave of pottery of a far more modern date than that to which the specimens above referred to would mostly seem to belong. Amongst these is a fragment of a shallow saucer-like vessel, perforated with accurately round holes, and portions of large jars or wide-mouthed *amphoræ*, with well-made handles, such as are shown in Figs. 1, 2, 3, and 4, in Plate XII.

The remains of pottery, in fact, like the human bones, show

\* I have since been informed that vessels of a similar kind are in common use in Brazil; and I have recently seen one from Algeria, still more like the Gibraltar specimens than the one given to me by Sir John Lubbock.

beyond doubt that the contents of the upper chamber of the Genista Cave must have been gradually introduced through a very long period of time, and include the relics of probably several successive populations. Some belonging to a rude and primitive epoch; whilst others, as remarked by Mr. Franks, may very probably be referred to the Roman or even to much later times.

Besides the articles of pottery, several implements of various kinds were met with, intermixed confusedly with the broken pots and bones. With one exception these implements are all of *stone or bone*.

The exception is a bronze fishhook, shown of the full size in Plate VIII. Fig. 9. This hook, with which we may suppose the tunny or the porpoise was captured by the ancient cave-dwellers, is, as it seems to me, rather peculiar in wanting either a hook or an eye for the attachment of the line, the shank being merely a little flattened towards the end. Mr. Franks is of opinion that this bronze implement belongs in all probability to a not very ancient period, and that it may be regarded as Roman or of the Roman time.

The bone implements found in the Genista Cave consist of (1) a long slender bodkin (Plate IX. Fig. 5); (2) a rude sort of scoop or spoon; (3) a portion, apparently, of a human fibula (though this is not certain), fashioned into a spike at one end; (4) a small bone needle (Plate IX. Fig. 8), and with respect to which I would remark that it differs from the bone needles found so abundantly in the Dordogne caverns, in the circumstance that the sides of the shaft above and below the irregularly shaped eye are channelled, in the same way as a modern packing needle is made, the eye in the otherwise more highly finished French needles being a simple round perforation. (5) A long stylet, probably a hair-pin, with a head consisting of several beads.

The other bone implements represented in Plate IX. are from amongst those found in Martin's and St. Michael's Caves.

Bone implements of the same kind are, as is well known, common everywhere; and Don Góngora y Martinez figures two from caves in Andalusia, which exactly represent some of those of which I have given drawings.



The implements and articles of stone found in the Genista Cave consist of (1) several polished *haches* (Figs. 4, 5, and 8, Plate VIII.), which in size and form closely resemble some of those met with in the Swiss lake-dwellings: they are formed out of a sort of hard greenstone. One, however, is peculiar (fig. 8) by its smaller size and its being ground, chiefly on one side, to a fine edge, so as to form a sort of chisel. This implement is made of a different material, fibrolite, and is particularly interesting perhaps on that account, inasmuch as stone implements made of it have occurred in all parts of the Peninsula, and are recorded by M. da Costa as occurring in Portugal. One of those from St. Michael's Cave (fig. 9) is of the same material, and we found among the remnants of an old collection of antiquities in the Governor's town residence (The Convent) a beautiful *hache* of the same kind of stone, which it was stated had come from one of the ancient tumuli on the shore of the bay, near the site of the ancient Carteia, and of which Mr. Smith makes cursory mention as containing 'stone hatchets and daggers,' and as placed not more than ten feet above the sea level. (2) Another class of stone implements are those formed of flint or rather chert, of which many have been met with in the Genista and other caverns; one from the former is figured in Plate VIII. Fig. 3. (3) Numerous remains of coarse stone querns and corresponding pestles or rubbers were met with in the Genista and other caverns, but the querns were all more or less broken, and may not improbably have been thrown away as useless. It should be remarked also, that, besides the manifestly fashioned mullers, many large round pebbles, which must have been purposely brought, were met with which might have been used for the same purpose. (4) A single specimen of a peculiar implement, which was met with in the Genista Cave, is shown of the full size in Plate VIII. Fig. 2. It belongs to the class of objects which some have regarded as whetstones, others as amulets or ornaments of some kind, but of which it does not seem very easy to assign the true object. That here shown is made of an excessively fine and soft sort of sandstone, which does not occur in any part of the rock itself, but which we noticed *in situ* at the head of the bay in



the neighbourhood of the ruins of Carteia. It is perforated at each end, and from the softness of the material, which can be rubbed off with the point of the finger, it would appear ill qualified either as a whetstone or to wear suspended. Don Góngora y Martinez figures a very similar object, only that it is not perforated, and which he terms '*alisador de piedra*,' but says nothing about the sort of stone of which it is made. Perforated stone implements of exactly the same kind, as it would seem, are figured in Sir Richard Colt Hoare's '*Ancient Wiltshire*.'

(5) Amongst the articles of stone is also a large portion of what appears to be an armlet or bracelet made of alabaster, and apparently much worn. It is shown in Plate VIII. Fig. 1. It is remarkable, if this ornament should really belong to a very ancient period, that the circle of which it once formed a part is quite perfect, and it is difficult to conceive how it could have been made except in a lathe. (6) Amongst non-descript objects found among the human remains, and the use of which it is difficult to surmise, unless it were used to blacken the eyelids, is an irregular shaped piece of coarse plumbago, on one side of which is a rounded pit such as might have been made by constant rubbing with the point of the finger.

As connected with these implements and utensils amongst which there is no trace of iron, it is curious to remark that among the animal bones associated with them is the cannon bone of a small ox which exhibits several incisions, both on the anterior and posterior sides, evidently made by chopping blows with a sharp and well-tempered metallic implement, and which, as I have tried, can be exactly imitated in a recent bone by blows from a sharp axe or sword. Nothing like them can be made either with a knife or by any stone implement I have seen. It is further remarkable that this is the only bone in the whole collection upon which any indubitable marks of human agency are manifest. From the position of the cuts it might almost be guessed that they had been inflicted in an attempt to hamstring the animal, as is sometimes done at the present day in the Spanish bull-ring.

*Human Bones.*—The human bones found in the upper

chamber of the Genista Cave must have belonged to at least thirty-five or thirty-six individuals, and these were of all ages and apparently of both sexes. All the bones, with the exceptions already alluded to, are in pretty much the same condition. A great many of them are much gnawed by a rodent having teeth the size of those of the rat or vole, but some among them exhibit apparently toothmarks which might be supposed to correspond with those made by a fox.

Bones belonging to nearly every region of the body were found, but by far the larger portion of the collection consists of fragments of crania, and of the bones of the upper and lower extremities, the latter far predominating.

With respect to them generally it may be said that hardly a single bone is entire, although some few would appear to have been broken either in their extraction from the ground or since. But the fractures are almost all evidently of very ancient date, indicating apparently that the soil in which they were deposited had been frequently and much disturbed.

*Crania.*—A large part of the collection consists of fragments of crania, which amount to between 300 and 400 in number. Out of this mass of fragments, scarcely any of which exceed four inches in diameter and most are far smaller, it has, as yet, not been found possible to construct any considerable portions of more than four or five *calvariæ*, and of these only one is sufficiently entire to allow of any approximation being made to its form when complete. This imperfect cranium is comprised of eight fragments, all evidently separated at a remote period, and found apparently at various depths in the earth of the cavern, as will be seen in the list of the numbers on each fragment.

No. 1, no depth given; 2, roof of cave; 18, 2 feet; 32, 4 feet; 35, 4 feet; 52, 6 feet; 84, 8 feet; 88, 6 feet; 121, 2 feet. And the other incomplete crania, of which it has been possible to put together any portion, are similarly composed of fragments found at various depths.

The greatest depth, as before stated, marked upon any fragment is eleven feet. There are about thirteen fragments of various sizes marked as occurring between nine and eleven feet, and of these seven undoubtedly belong to one and the

same cranium, although they cannot be pieced together. All those deeper seated fragments, as above remarked, are distinguished from the more superficial ones by their greater specific gravity, and their being coated inside and out with a thin, hard, crystalline, calcareous deposit of stalagmite. Though none of these fragments can be fitted together they suffice to show that the skull must have been of large size and great thickness, and with the muscular impressions strongly marked. Two other fragments, one found at seven and the other at ten feet, also belong to one and the same cranium, so that there can be no doubt the ground must have been frequently disturbed after the skulls had been broken. But to what cause are we to assign such a complete and universal comminution as these bones have undergone?

The portions of the frontal bone exhibit no peculiarity worth notice, and in scarcely any is there any elevation of the superciliary ridges, nor in the site of the frontal sinuses; on the contrary, these bones are rather remarkable for their uniform smoothness and evenness of outline, and in all the forehead is well arched.

The teeth in the numerous jaws, both upper and lower, are in most cases much and evenly worn, and generally speaking quite sound. None of the *maxilla* exhibit any tendency to prognathism. As our examination of the Genista Cave bones took place shortly after the time when the world was resounding with the fame of the Moulin-Quignon jaw, we paid particular attention to the lower jaws, of which numerous specimens were afforded in the collection. Without detailing the particulars, all that it now seems necessary to remark is, that the characters presented by these mandibles showed that they might be about equally divided into those with an inverted and those with an everted angle; and, moreover, that the angle formed by the ascending and horizontal branches varied from  $130^{\circ}$  to  $108^{\circ}$ , or quite within the normal limits. One mandible, however, particularly struck us from its close resemblance to that upon which so much perhaps undue importance had been placed.

2. *Bones of the Trunk.*—Very few of the bones belonging

to the trunk were contained in the collection first sent to England. There were a few vertebræ of small size, one or two fragments of ribs, and two or three clavicles, one entire, and all of small size and delicate form, and probably female. One entire *os innominatum* of a young male was noticed.

3. *Bones of the Upper Extremity*.—The bones belonging to the upper extremity were principally twelve *humeri*, of which nine were of small size and three larger; none of them presented any characters calling for remark.\* Of the forearm, we received portions of five or six *ulnas*, and some fragments of the *radius*, all of small size. Besides these were numerous metacarpals and phalanges.

4. *Bones of the Lower Extremity*.—One of the most remarkable parts of the collection of human bones from the Genista, and also from the other Gibraltar caves, consists of those belonging to the lower extremity. The number of bones of this class found in the Genista Cave was very great, and they were computed to have belonged to at least thirty-five or thirty-six individuals. There were about thirty

\* It should be noted that none of the *humeri* found in the Genista Cave were perforated above the condyles. But in St. Michael's Cave, the lower two-thirds of a humerus of remarkably small size, and with a perforation, was found. The only perforated humerus I have noticed in the Royal College of Surgeons is that of a Bushwoman, which in that particular, as well as in its diminutive size, bears the strongest possible resemblance to the Gibraltar specimen. It would seem, however, from the remarks that fell from several speakers at the meeting of the Congress in Paris, that the perforated condition of the humerus in collections from caverns and ancient sepultures of much later date, is far more common than could have been supposed from the examination of more modern remains, in which, except in the Hottentots and Bushmen, such a condition is excessively rare. For instance, M. Broca states that he, in conjunction with M. Papillard, had noticed perforation in four and a half per cent. of the arm-bones collected in the 'Cimetière du Sud' at Paris; and that in the Grotto of Orrony, whose contents are referred to the Bronze period, as many as eight *humeri* out of thirty-two were perforated; but this extraordinary proportion, he thinks, might be due to the cavern having been a sort of 'family vault.' Again, M. Dupont found thirty per cent. of perforated bones in the caves of the Valley of the Lesse, belonging to the Reindeer period; whilst M. Leguay, in a sort of dolmen, '*allée couverte*,' at Argenteuil, observed twenty-five per cent. to be perforated; and M. Pruner-Bey found twenty-six per cent. in the same condition in bones from Vauréal. And lastly, to come to a more recent date, MM. Hamy and Sauvage noticed 4·6 per cent. in bones removed from a cemetery in the Rue des Innocents. Nor should it be left unnoticed that M. Pruner-Bey states that condition to be common in Guanche skeletons.

thigh bones, and from eighteen to twenty tibias, but, strange to say, portions of only three *fibulæ* were observed.

Not only were these bones very numerous, but some of them presented such remarkable characters as to attract our special attention. As a similar conformation to that I am about to describe has since been frequently noticed, more especially in France, where M. Broca has paid particular attention to it—the surprise that the first aspect of the carinated femurs and platymeric *tibiæ* excited in Dr. Falconer and myself can now hardly be imagined—but at the time bones of this type, which till then appear to have been altogether unnoticed, seemed to us of the utmost interest. And so in fact they really are.

1. *Femur*.—In the first place as regards the long bones of the inferior extremity it may be remarked, that, omitting the very young or immature specimens, they exhibited the greatest diversity in size. About half the number being of a comparatively large type, and the others, corresponding more nearly with the arm bones, small.

With respect to the thigh bones, one of the most remarkable characters presented in a great many consisted in the enormous development of the *linea aspera*, which in these bones forms a sort of prominent ridge, or keel, of great height and thickness, in many cases extending from one end of the bone to the other, and in some limited to the central portion of its length. In several instances this prominent keel is so enormously developed as to give the bone an aspect altogether unlike the human. Five or six of the larger thigh bones from the Genista Cave presented this character in a marked degree and four of the smaller sized bones. The carinated bones, with one exception, are not more curved than usual, and they are perfectly natural and healthy otherwise in external appearance. Several of them, however, when cut across were found to be extraordinarily thick, so that the medullary cavity was reduced to a very small size. In sections prepared for the microscope it was found that the substance was so infiltrated with calc spar that it was difficult to make out the structure, but what could be seen of it presented nothing unusual.



2. *The Bones of the Leg.*—Of these about half, or in the same proportion as the thigh bones, exhibited a very remarkable conformation. This peculiarity in some of the bones existed to such an extent as to lead several experienced anatomists to whom they were shown almost to doubt their being human tibiæ.

The form in question—which is now well-known and has been fully described by M. Broca\*—arises from an extreme lateral compression of the shaft, in consequence of which it loses its natural subtriangular form, and presents an acute edge both in front and behind.

Though flattened to such an extent, none of the tibiæ so affected present any other morbid appearance, and they are nearly all perfectly straight. A circumstance which alone is almost sufficient to refute the notion, at one time, I believe, entertained by some distinguished anthropologists, that the condition was due to a rachitic affection. In cases of rickets, the bone, though doubtless occasionally even more compressed than in the platynemic form, is invariably more or less curved. Numerous instances of similar thigh and leg bones have been discovered in nearly all the other caves from which Captain Brome has obtained human remains.

I have stated that, amongst the very numerous fragments of crania afforded by the upper chamber of the Genista Cave, I had been able to put together any considerable part of only one skull. This part includes, however, sufficient to show in some degree the probable form that the skull would have presented when entire, and from its appearance there is no doubt that it belonged to the same type as the more perfect ones discovered in Genista Cave, No. 3, in association (as will be seen in the list given by Captain Brome, p. 128) with similar animal and other remains. I will proceed now, therefore, to describe the crania in question, which amply suffice to show the cranial conformation of the primitive inhabitants of the rock.

In Plate VII. will be seen representations of two of the most perfect of these crania, and these figures will demon-

\* *Mémoires sur les Ossements des Eyzies*, pp. 14–21. Paris, 1868.



strate not only how closely they resemble each other, but also that they exhibit anything but a low type of conformation.

Their dimensions, stated in the order I have elsewhere followed, are as under :

|                                                   | No. 1. | No. 2. |
|---------------------------------------------------|--------|--------|
| 1. Length . . . . .                               | 7·35   | 7·35   |
| 2. Breadth . . . . .                              | 5·5    | 5·6    |
| 3. Height . . . . .                               | 5·7    | 6·1    |
| 4. Least frontal width . . . . .                  | 3·9    | 3·8    |
| 5. Greatest frontal width . . . . .               | 5·0    | 4·9    |
| 6. Parietal width . . . . .                       | 5·4    | 5·4    |
| 7. Occipital " . . . . .                          | 4·45   | 4·5    |
| 8. Zygomatic " . . . . .                          | 5·2    | 5·2    |
| 9. Frontal radius . . . . .                       | 4·7    | 4·75   |
| 10. Vertical " . . . . .                          | 4·8    | 4·9    |
| 11. Parietal " . . . . .                          | 4·9    | 5·1    |
| 12. Occipital " . . . . .                         | 4·25   | 4·9    |
| 13. Maxillary " . . . . .                         | 4·1    | 4·0    |
| 14. Fronto-nasal radius . . . . .                 | 3·75   | 3·65   |
| 15. Circumference . . . . .                       | 20·6   | 20·8   |
| 16. Longitudinal arc . . . . .                    | 14·0   | 15·3   |
| 17. Frontal portion of longitudinal arc . . . . . | 5·2    | 4·8    |
| 18. Parietal " " . . . . .                        | 4·8    | 5·6    |
| 19. Occipital " " . . . . .                       | 4·0    | 4·9    |
| 20. Frontal transverse arc . . . . .              | 12·5   | 12·2   |
| 21. Vertical " " . . . . .                        | 13·2   | 13·2   |
| 22. Parietal " " . . . . .                        | 13·3   | 13·8   |
| 23. Occipital " " . . . . .                       | 11·4   | 11·6   |
| 24. Cephalic index . . . . .                      | ·748   | ·761   |
| 25. Altitudinal " . . . . .                       | ·774   | ·809   |

From these measurements it will be seen, that the crania are almost exactly alike in every respect, and the other two found with them in the same cave exhibit but little diversity, except that one is considerably smaller and probably that of a female. The numbers placed against each measurement prove that these crania from the Genista Cave, No. 3, differ very widely in almost every particular from that found by Sir James Cochrane in the Judge's or Glen Rocky Cave, as has been already noticed (p. 144).

The crania are perfectly symmetrical, and from their size and general conformation would at once be pronounced to belong to a high type. They are dolichocephalic, quite orthognathous, and wholly aphanozygous. In one of them the frontal sinuses are considerably more developed than they are in the other, but in neither is there any thickening, properly

speaking, of the supraorbital border. In one the *ossa nasi* are broken away too much to allow their original size and form to be estimated, but in the other they are long and prominent, and probably betoken that the owner had a prominent or aquiline nose.

They are both the skulls of men in the prime of life, although one appears to be older than the other, as the teeth are considerably more worn. But, in both, the remaining teeth are perfectly sound, and are worn flat and even.

As regards the race to which these crania may have belonged, of course, anything that can be offered is merely conjectural, and as I have but little confidence in conclusions derived from the comparison of minute characters, I think it needless here to enter into much detail in the matter, simply stating that, so far as I can judge, these crania bear the closest possible resemblance to the type of Basque skulls which have been so well and so minutely described by M. Broca.\*

On the return of Dr. Falconer and myself from Gibraltar through Spain, we had an opportunity, through the kindness of the late Don Casiano de Prado and of M. Graells, of inspecting an extremely interesting specimen of a human skull which had been found in some ancient copper mine workings in the Asturias, together with hammers made of stags' horn, and other rude implements, and which, from its bright green colour, had evidently been long resident in the situation where it was discovered. This cranium was exactly of the same conformation as those from the Genista Cave.† And besides this, M. Broca's account of the Basque crania from Guipuscoa leaves no doubt whatever that they belong to the same type. All the characters assigned by that acute observer to the dolichocephalic form of the Basque crania, are plainly exhibited in the Gibraltar specimens, and at this meeting of the Prehistoric Congress I have

\* Sur les caractères des Crânes basques, 1862, and Mémoire sur les Crânes des Basques de St.-Jean-de-Luz, 1868.

† A brief notice of this ancient copper mine, which has of late years been again opened, will be found in Don Casiano de Prado's Descripción física y geológica de la Provincia de Madrid, 1864, p. 218.

been glad to have the opinion I had previously entertained, with respect to the affinities of the Gibraltar and Basque crania fully confirmed by him after careful inspection of the skulls themselves. The characters assigned by M. Broca to the dolichocephalic type of Basque crania may be briefly stated :—

I. That although dolichocephalic, even to a higher degree than the average of French crania, they are distinguished by the circumstance that the length of the cranium is due to development more in the hinder or occipital region than in the frontal; they present, as M. Broca terms it, a '*dolichocéphalie occipitale*' due as well to the increased development of the posterior cerebral lobes, as to the smaller size of the anterior region. But, at the same time, though in this respect showing an approach to the Negro type, he considers that they differ from that type, and from all the African races, by the smallness of the maxilla and the slighter development of the cerebellar fossæ, and the attendant relative atrophy of the occipital protuberance, and the remarkable want of development of the occipital spine. And these characters, according to him, differentiate the Basque crania also from other European races.

Without pretending to decide how far M. Broca's statements may be borne out upon more extended comparisons with other European crania than he appears to have instituted at the time he wrote, I will content myself with saying, that whatever may be true with respect to the Guipuscoan skulls studied by him, is equally true of those from the Genista Cave.

M. Góngora y Martínez, in the memoir already cited, gives numerous figures of crania found by him in various caverns and dolmens in Andalusia, which, though on almost too small a scale to admit of accurate judgment, would seem to show that the ancient inhabitants of that part of the Iberian peninsula had crania of the same type as those here described; so that I imagine there can be little doubt that a pretty uniform priscan race at one time pervaded the peninsula from one end to the other, and that this race is at the present day represented by at any rate a part of the

population now inhabiting the Basque provinces. The interesting question then arises as to the derivation and affinities of this aboriginal Iberian race. Although one of a wholly speculative nature, and for whose solution we are at present scarcely in possession of sufficient materials, it seems to me that the view suggested by M. Broca is probably not very far from the truth. He says that if the origin of the Basques is to be sought beyond the confines of their own country, the inquiry should be directed, not among the Celts, nor among the other Indo-European races, but rather in the direction of the northern zone of Africa. And he remarks that it is highly probable that in the paleogeography of our continent, Spain was once continuous with the North of Africa, and consequently there is no cause for astonishment when we find close analogies between the primitive populations of the two regions, even were it not well known that, from the most ancient times, migrations have taken place across the Straits of Gibraltar.

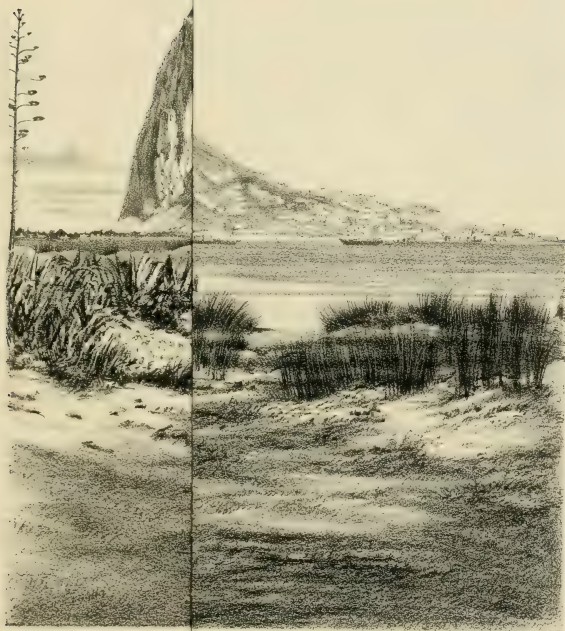
Nor do I think it unreasonable to expect that it may eventually be shown that the Kabyles of North Africa are the immediate representatives in that region of the priscan inhabitants of Gibraltar and Andalusia. The curious coincidence I have pointed out between the spouted water-pitcher from Algeria, with many of the fragments found in the Gibraltar and Andalusian caves, deserves attention in this regard; and I may also mention that, when our attention was first directed to the peculiar conformation of the thigh- and leg-bones from the Genista Cave, M. Pruner-Bey was good enough to forward to us a femur and tibia evidently of great antiquity, and which he referred to the Berber race—of which bones the former is strongly carinate, and the other decidedly, though not very much, compressed.

As regards the question of the use to which the various Gibraltar Caves were put by the ancient inhabitants, little remains to be said. Some of them might probably have been used as habitations, and some merely as places of refuge on sudden emergencies of danger; as, for instance, the Genista Cave, No. 4, which, from its situation at a considerable distance below the edge of a vertical cliff, could scarcely have

afforded a convenient habitation for daily use. Others again, and this I conceive is especially the case with Genista Cave, No. 1, were in all probability merely sepulchral. It is hardly conceivable that a cavern could have been inhabited which contained such an enormous mass of human bones, and which, moreover, was apparently filled to the very roof with the broken bones of men and animals imbedded in earth. I say apparently, because, as has been noticed, it is evident that a large portion of the original rocky roof of the cavern had fallen in at some very remote period. The concussion of such a falling mass would also account in some measure, perhaps, for the displacement and comminution of the bones, but it is equally if not more probable that this might be due to the disturbance by reiterated interments. Nor is the presence among these remains of the stone implements, ornaments, pottery, charcoal, &c., opposed to this view, inasmuch as these articles might well have been introduced as tokens of affection, or as forming part of the funeral rites. The case of the cavern of Orrony, noticed by M. Broca,\* appears to afford a striking corroboration of this view: its human contents, in the brief account given, seem to have been in much the same condition as those of the Genista Cave. The cavern of Aurignac is another instance of the same kind.

It would seem that, even at the present day, caves or hollows very similar to those on the Windmill Hill Flats are still utilised; for in a letter from Mr. Green, a resident of Tetuan, to Captain Brome, it is stated that 'in the neighbourhood of Tetuan, where the rocky district is said much to resemble Europa Flats, there are numerous fissures and caves, some of which are inhabited, or rather used as workshops, by tile makers.'

\* *Compte rendu du Congrès international, etc.*, 1re livraison, 1868, p. 145.





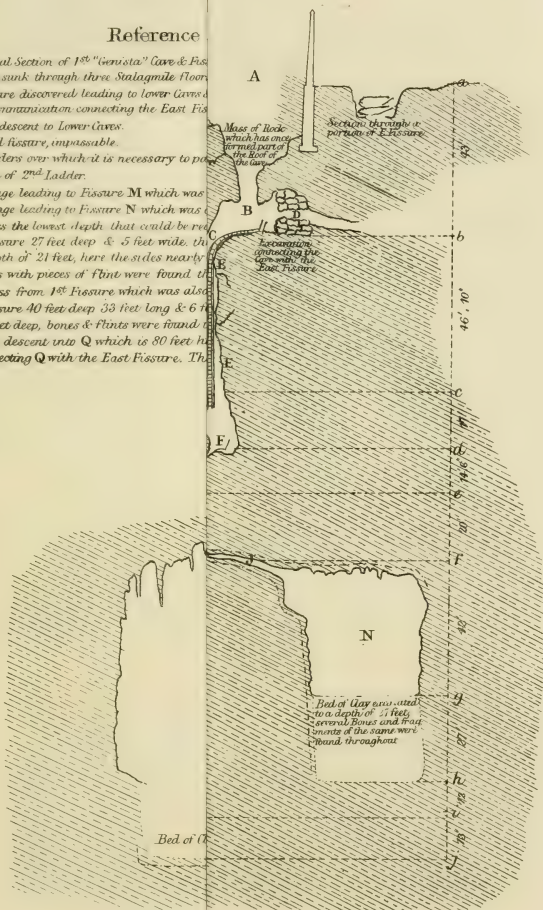






# Reference

- A. Vertical Section of 1<sup>st</sup> "Grotto" Cave & Fissure
- B. Shaft sunk through three Stalagmite Floors
- C. Aperture discovered leading to lower Caves
- D. 1<sup>st</sup> Communication connecting the East Fissure
- E. First descent to Lower Caves.
- F. Small fissure, impassable.
- G. Boulders over which it is necessary to pass
- H. Head of 2<sup>nd</sup> Ladder.
- I. Passage leading to Fissure M which was
- J. Passage leading to Fissure N which was
- K. Marks the lowest depth that could be reached
- M. A Fissure 27 feet deep & 5 feet wide. In a depth of 21 feet, here the sides nearly meet. Bones with pieces of flint were found in it.
- O. Egress from 1<sup>st</sup> Fissure which was also
- N. A Fissure 40 feet deep 33 feet long & 6 feet wide. 27 feet deep, bones & flints were found in it.
- P. Steep descent into Q which is 80 feet high connecting Q with the East Fissure. The





**"GENISTA" CAVE**

No 2.

WINDMILL HILL, GIBRALTAR,

Discovered by J. F. Brome, Esq<sup>re</sup>  
Gov<sup>r</sup> Mil<sup>y</sup> Prisons,  
Nov<sup>r</sup> 4<sup>th</sup> 1864.

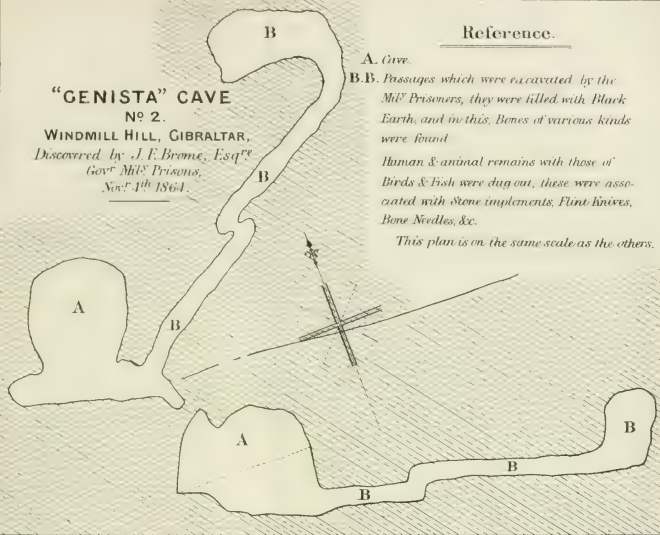
Reference.

A. Cave.

B.B. Passages which were excavated by the  
Mil<sup>y</sup> Prisoners, they were filled with Black  
Earth, and in this, Bones of various kinds  
were found

Human & animal remains with those of  
Birds & Fish were dug out, these were asso-  
ciated with Stone implements, Flint knives,  
Bone Needles, &c.

This plan is on the same scale as the others.



A. Section of "Genista" Cave No 3. on F.G.

B. Entrance to cave.

C. Excavation, from which Red Breccia & bones  
were found.

Human & Animal Remains were found in this  
cave associated with Stone Hatchets & Flint-knives  
with remains of Birds, Fish, Pottery, Bone Needles,  
Sea shells, charcoal, &c.

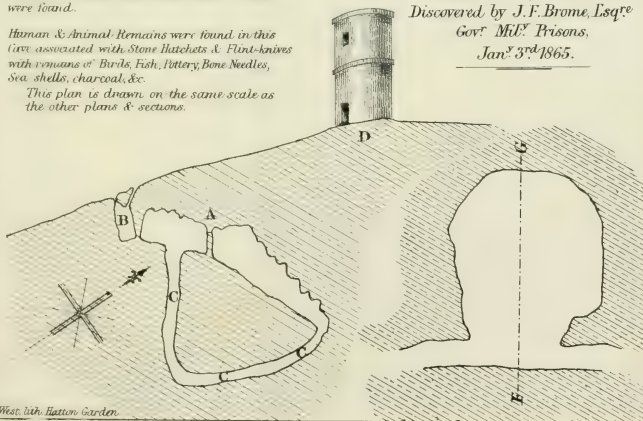
This plan is drawn on the same scale as  
the other plans & sections.

**"GENISTA" CAVE**

No 3.

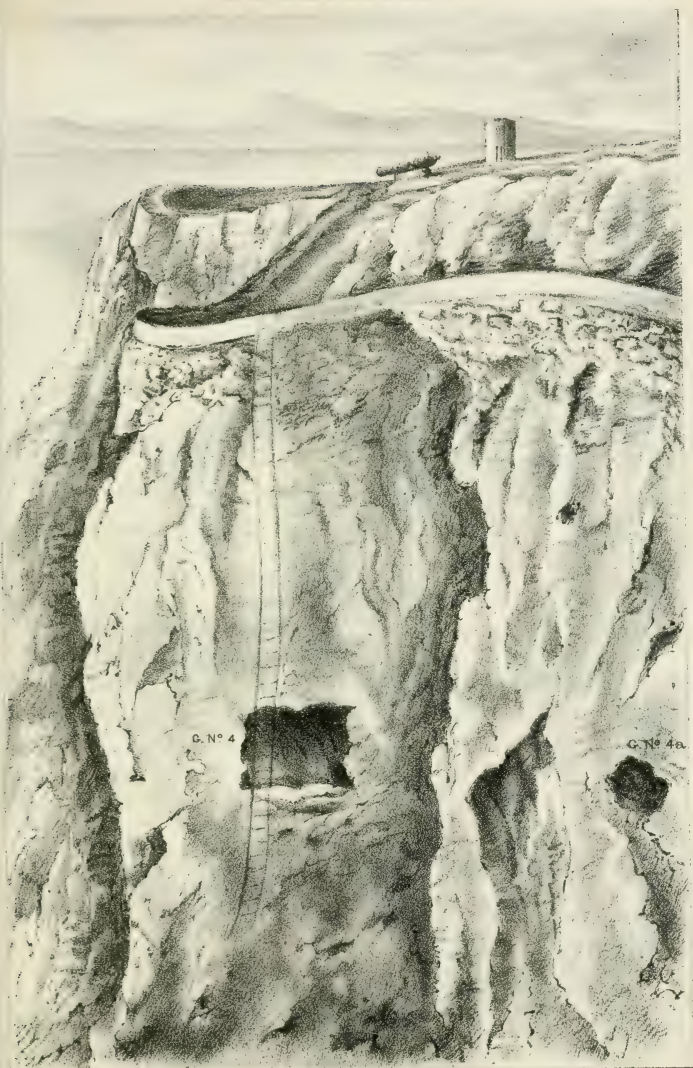
WINDMILL HILL, GIBRALTAR.

Discovered by J. F. Brome, Esq<sup>re</sup>  
Gov<sup>r</sup> Mil<sup>y</sup> Prisons,  
Jan<sup>y</sup> 3<sup>rd</sup> 1865.









W. Westlith Flatter Garden.



# ALTAR

## Reference to Plan & Sections

- A. Platform called, "St Michael's" Platform, in front
- B. Entrance to Cave.
- C. Aperture leading to the back caverns & lower ram
- D. Marks the spot where the current of air was detected to the discovery of the new caves.
- E. Entrance to LEONORA'S CAVES No 1.
- F. Passages leading to No 1 Cave, in which most beautiful stalactite formations everywhere meet the eye.
- G. Entrance to No 1 Cave.
- H. A current of air detected at this fissure led to its enlargement and the discovery of the Caves Nos 2, 3 & 4.
- K. Passage leading to cavernous hollow 1, & to No 2.
- N. Entrance to No 3 Cave.
- O. Entrance to No 4 Cave.
- S. Large Stalagmite pillar in centre of Upper Chamber.
- Z. Z. Z. Caverns behind the Upper Chamber.
- o o o Indicate Columns (Stalag<sup>ms</sup>) which reach the roof of the
- △△△ — D<sup>o</sup> — D<sup>o</sup> started or broken.

All excavations in the floors or sides of the Caves bounded thus, - x-x-x-x-x-

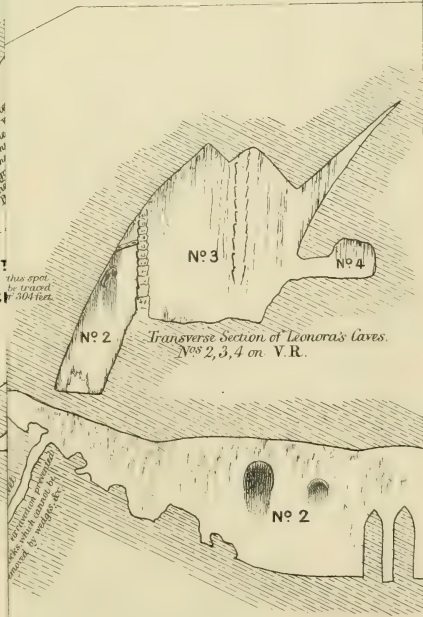
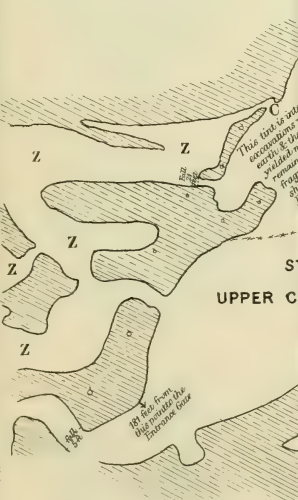
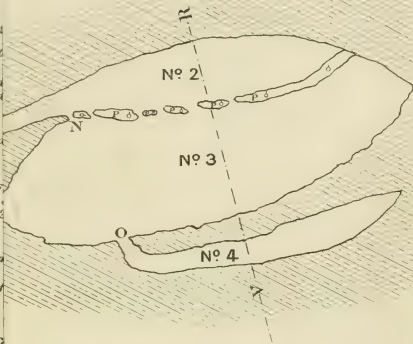




FIG. 1.

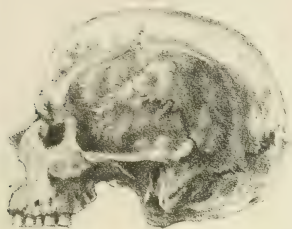


FIG. 2.



FIG. 3.

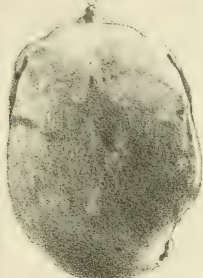


FIG. 9.



FIG. 6.

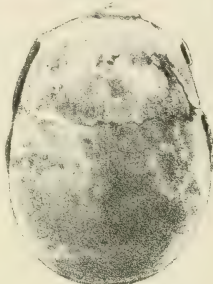


FIG. 5.

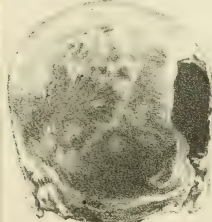


FIG. 10.

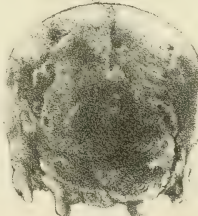


FIG. 7.

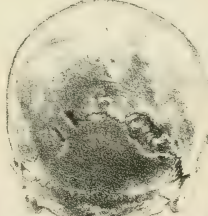


FIG. 4.



FIG. 11.

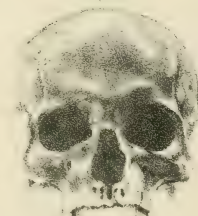
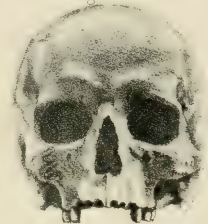


FIG. 8.







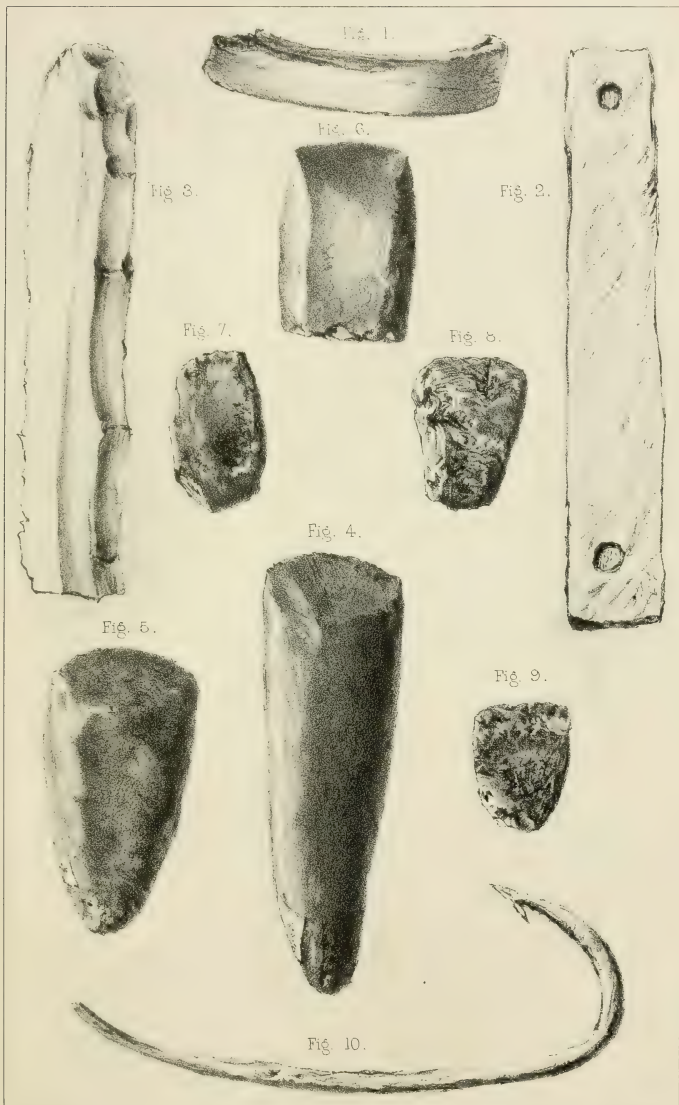




Fig. 1.

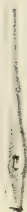


Fig. 3.



Fig. 4.



Fig. 6.



Fig. 7.

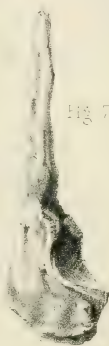


Fig. 2.



Fig. 5.

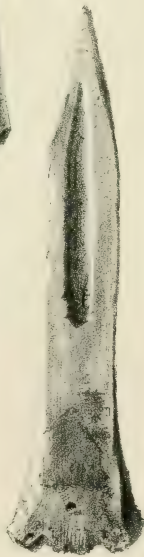


Fig. 8.





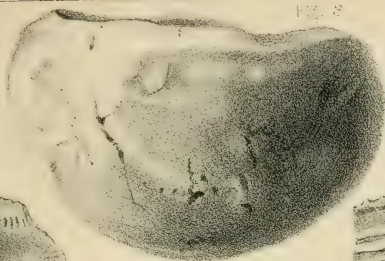


Fig. 1.



Fig. 4.

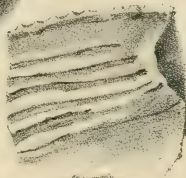


Fig. 3.

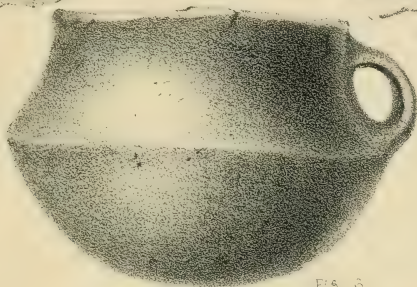


Fig. 2.

Fig. 3.



Fig. 5.

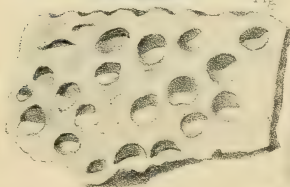


Fig. 2.

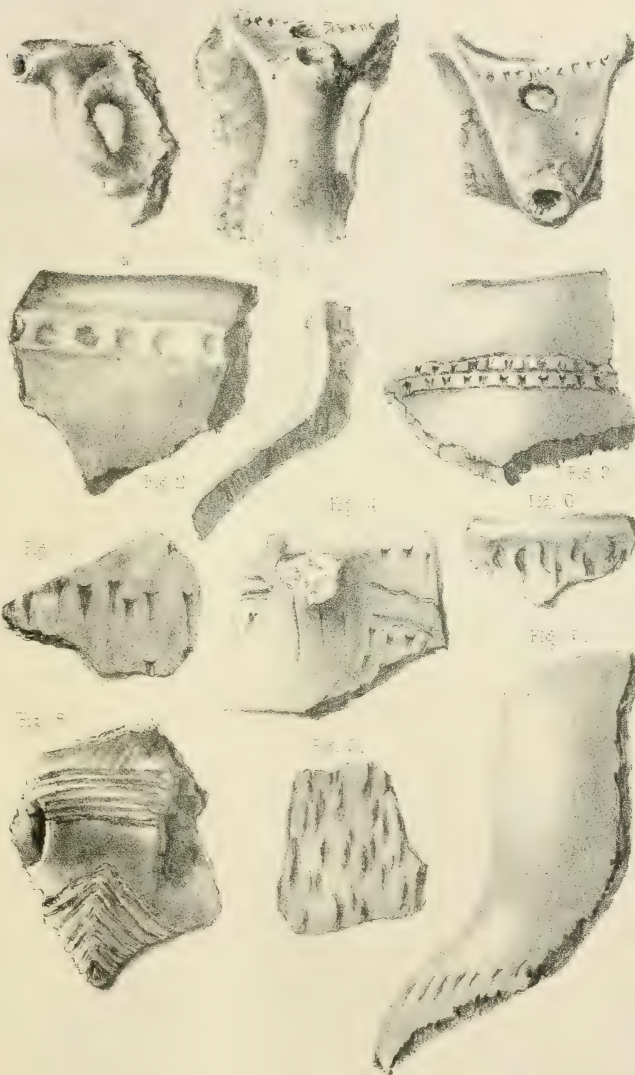


Fig. 7.

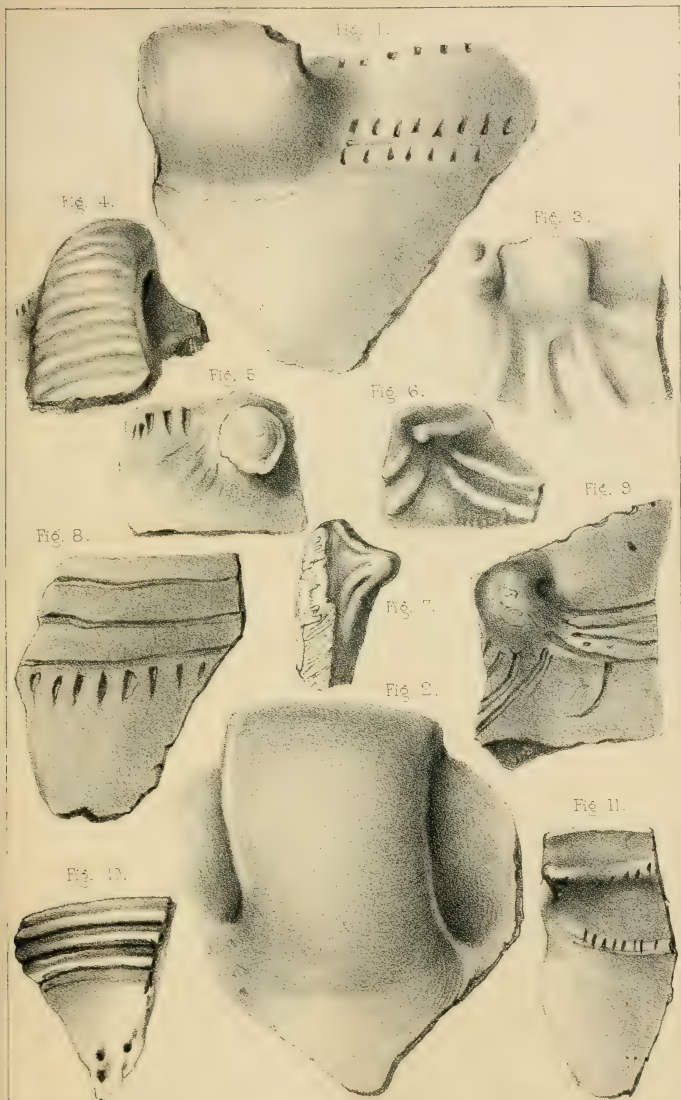














*Description of Plates.*

- Pl. I. View of the Western Face of the Rock of Gibraltar.
- Pl. II. Plan of the Rock, showing the Situation of the various Caves.
- Pl. III. Vertical Section of the Genista Cave, No. 1.
- Pl. IV. Vertical Sections and Plans of Genista Caves, No. 2 and No. 3.
- Pl. V. Sketch showing the Position of the Entrance of Genista Cave, No. 4.
- Pl. VI. Plan and Section of Part of St. Michael's Cavern, to show the Chambers and Passages discovered by Captain Brome, and named the 'Leonora's Caves.'
- Pl. VII. Figures of Crania from Genista Cave, No. 3, and from 'Judge's Cave.'
- Figs. 1, 2, 3, 4. Cranium from Genista Cave.
- Figs. 5, 6, 7, 8.                   "                   "
- Figs. 9, 10, 11.                   "                   Judge's Cave.
- Pl. VIII. Fig. 1. Portion of Armlet of Alabaster, half size.
- Fig. 2. Amulet or Whetstone, natural size.
- Fig. 3. Flint Knife, natural size.
- Figs. 4-7. Polished Stone Implements made of a kind of Greenstone, half size.
- Figs. 8, 9. Polished Stone Implements made of Fibrolite, half size.
- Fig. 10. Bronze Fishhook.
- Pl. IX. Figs. 1-7. Various Bone Implements.
- Fig. 8. A Bone Needle.
- Pl. X. Various Specimens of Pottery.
- Pl. XI. Various Specimens of Pottery.
- Fig. 1. represents the Spout of a Drinking Vessel.
- Pl. XII. Different Varieties of Handles.



## ON THE CRANIA AND BONES OF LES EYZIES, DORDOGNE.

BY PROFESSOR PAUL BROCA.

*(General Secretary of the Anthropological Society of Paris.)*

No discovery could offer more interest to anthropology than that of these bones. It is the complement—one would almost say the crowning work—of the important discoveries which M. Lartet, senior, and his much-lamented fellow-labourer, Mr. Christy, made four years ago in the caverns of Perigord, and particularly in the cave of Les Eyzies. The numerous objects found in these caverns have not only furnished to us the most incontestable and striking proofs of the contemporaneity of man with the mammoth, but they have revealed to us the most curious details of the life and customs of the ancient cave-men of Perigord. The anatomical characteristics of the intelligent and artistic race whose admirable carvings and sculptures are to us a subject of astonishment, had alone to be disclosed to us.

The latest researches in the new cave at Les Eyzies by M. Lartet, junior, permit us now to bridge this gap. No doubt can be raised as to the authenticity and high antiquity of the bones which these researches have brought to light. The stratigraphical details furnished by this gentleman prove, not only that they are as ancient as, but that they are even more ancient than, the carved objects of the great cavern of Les Eyzies; the latter correspond to the epoch in which the reindeer was already predominant among the fauna, while the former seem to approximate rather to the time of the mammoth; and although a very long period between these two epochs might have elapsed, we are compelled to believe that the passage from one to the other took place gradually, without any ethnological revolution; that the same race remained without interruption in the same place; and that, if

the bones which we are about to examine are not those of the artists of the reindeer period, they are at least those of their ancestors.

The remains of quaternary man that we have examined hitherto, belong for the most part to individuals of short stature, in whom the cranium is of small capacity, and the face more or less prognathous. We should hence conclude that the primitive population of Europe either belonged to a negroid or mongoloid race (according to one or other hypothesis), in whom the stature did not much exceed that of the modern Laplanders.

We consider that this opinion rests on well-ascertained facts. It rests also on a preconceived idea which we have for a long time opposed, viz. that there was in quaternary Europe but one single race of man. Based on the ethnological theory, that the diversity of the human races results from the influence of media (such as climate, food, soil, &c.), we admit that the typical differences must be effaced as we pass backwards in time; and when the polygenists objected, that the separation of the principal groups of races was already complete from the origin of historic time, we replied that it was not in very recent times, but in the immense and incalculable periods which preceded them, that the divergences from the original type were manifested. Reduced to these terms, the question of the unity of the human race became adjourned to the moment when palæontology should have discovered some remains of primitive man, or at least those of races of the quaternary epoch. We should consider that these races, separated from us by thousands of ages, perhaps, and of a certainty infinitely more approximated to the human *origines* than the most ancient of the historic races, must present, if not an absolute uniformity, at least a manifest convergence towards the type of the common mould in which we can conceive them to have been cast.

But it happens here, as does so frequently happen in other things, that the facts brought to light contradict a preconceived theory. The quaternary race of Les Eyzies differs from the quaternary race of the caverns of Belgium, as much as the most dissimilar modern races differ among

themselves. The contrast is complete, not only when we consider the conformation and volume of the head, but also when we consider the form and dimensions of the limb-bones.

The greater part of the bones which have been discovered belong to three individuals. There are three crania, of which one is perfect. Not one of the skeletons is capable of being put together, but in classing the bones of the trunk and of the members in accordance with the shape, colour, and density, we are able to separate them chiefly into three groups, which, in respect of the characters referred to, appear to belong to the three crania. There are besides some small fragments of a cranium belonging to an adult, and some others of one belonging to a child. The number of bodies deposited in this burying-place was five—it can hardly be said that there were more. It is, therefore, not impossible that all these individuals may have been members of one family. Of the relics of these five persons, we can only speak of three; the remains of the two others being represented by insignificant fragments.

The first is a man much advanced in life, the second is a woman of about 40 years, the third is an adult man, who appears to be about 45. One of the femurs of the old man presents traces of an old injury, received either in hunting or in war; part of the cranium of the woman has been driven in by a blow with a stone hatchet about three weeks before her death. Two out of the three individuals therefore present in their skeletons traumatic lesions, produced, the one certainly, the other probably, by the hand of man. These facts lead us to suppose that the habits of this tribe were turbulent and barbarous.

Contrary to what we at present know concerning quaternary man, the stature of the cave-holders of Les Eyzies was tall—taller than that known as middle-height of our day. Judging from the length of the femur, the old man was certainly more than six feet in height. The adult man (No. 3), though still tall, fell somewhat short of this measure. The woman attained, if she did not surpass, the average height of man of the present day. The strength of these individuals

was in proportion to their stature. The bones of the old man are exceedingly strong. His femur exceeded in breadth and thickness all those with which I have been able to compare it. In the case of the two men, but in that especially of the old man, the rough surfaces for the origins of muscles are strongly marked, and denote a development remarkable for physical force.

Among the more remarkable characteristics of the limb-bones, we shall point out first the form of the body of the femur, which is a little arched at its upper part, and which presents in the line of the *linea aspera* a longitudinal ridge of great thickness. These characters have been observed on other prehistoric femurs.

The tibiæ are flattened transversely to a remarkable degree, and this flattening reminds us of the forms of the tibiæ in the anthropoid apes. They are decidedly not curved, and therefore they do not possess, although it has been stated that they do, anything in common with rachitic tibiæ. The same flattened form of tibia has been pointed out in the Dolmen of Chamant and of Maintenon. The bones exhibited at the Congress by Mr. Busk prove that it existed also among the races which inhabited the caverns of Gibraltar. Finally, we have assured ourselves that it exists, but in a much less marked degree, in a considerable number of the tibiæ of Negroes. We are inclined to believe that it has a constant relation to a small development of calf.

The ulnæ present at their upper extremity a sigmoid cavity, very small in respect of the magnitude of the neighbouring apophyses; and below this cavity there is a curvature directed forwards similar to what we find in the great apes.

The skulls are of remarkable capacity—that of the old man measures 1,590 cubic centimètres; the two others have not been measured, but their capacity is evidently very great, and much superior to that of the average skull of the present day. These crania have besides a great frontal development, which permits us to predicate favourably respecting the intelligence of the inhabitants of Les Eyzies.

The form of these two skulls is very dolichocephalic—contrary to the opinion of those who still admit with Retzius that all the autochthones of Europe were brachycephalic. This dolichocephalism is not due to the *narrowness* of the crania, but to their *length*.

The cranial sutures in these three individuals present certain obliterations, the result of advancing years. On examining these obliterations, at the external surface of the three, but especially on the internal surface of Nos. 2 and 3, we find that the effacing process, instead of passing from behind forwards, as is the case in civilised races, proceeds in the contrary direction. This condition of things obtains in all living savage races.

The superciliary ridges of the two men are greatly developed, the root of the nose is much depressed, the forehead is large, vertical, and arched—especially in the median line. The temporal regions are not particularly prominent. In the two skulls of which the face is preserved, we find that one is orthognathic in the orbito-nasal region, while the alveoli are very prognathic. The orbits are very broad but rather low in height. The face in its *ensemble* is very broad in proportion to its height.

The lower jaw has a projecting chin, and the curve of the alveolar arches is a very diverging one. We find here none of the simious characters which have been observed in the celebrated jaw of La Naulette, contemporaneous with the mammoth, as were the bones of Les Eyzies. But the development in breadth of the ascending ramus of the jaw is truly excessive. It is greater even than in the Australians and the New Caledonians. In this particular respect the jaw of Les Eyzies finds its place between the most inferior of living races and the anthropomorphic apes. But in all its other traits it presents, on the contrary, an exaggeration of the characters which distinguish man from the ape.

If, in conclusion, we cast a general glance over the divers elements that we have just examined, we shall find in the race of Les Eyzies a remarkable combination of characters—some of superiority and some of inferiority. The great capacity of the brain, the development of the frontal region,

the fine elliptical form of the anterior part of the profile of the skull, the orthognathic disposition of the superior facial region (from which arises a considerable enlargement of the facial angle of Camper), are incontestable characteristics of superiority, such as we are accustomed to meet with only in civilised races. On the other hand, the great breadth of the face, the alveolar prognathism, the enormous development of the ascending ramus of the jaw, the extent and roughness of the surfaces for the insertion of muscles, and especially of the masticators, suggest the idea of a savage and brutal race; and we are led to suspect that the woman has been slain by a blow with a hatchet, and that the thigh bone of the old man bears traces of an old and serious injury. Examine, again, the simplicity of the sutures, and their probably equally simple obliterations, which pass from before backwards, as is the case with barbarous peoples. Let us add that the shape of the bones, and, in particular, the extraordinary development of the ridge of the femur, indicate a high degree of muscular power. Let us review these three characteristics—the excessive breadth of the ramus of the jaw; the sub-coronoid curvature of the ulna, of which the coronoid cavity is extremely shallow, and, above all, the flattening of the tibiæ, are more or less manifestly simious; and we shall thus complete the picture of a race which, in some of its characteristics, attained the highest and noblest degrees of human morphology, and in others descended even below the most degraded anthropological types of the present day.

This antithesis at first sight appears paradoxical; but is it not the anatomical confirmation of that which the discoveries of Messrs. Lartet (senior) and Christy have already taught us concerning the life and habits of the denizens of the cave of Perigord? The men who in the quaternary epoch were the initiators of progress, and the precursors of civilisation, who developed the remarkable industry and wonderful arts of which we to-day admire the products, must of necessity have combined with the intelligence which invents and brings to perfection, much strength of body and habits of war and of the chase, which alone could then assure them



security and subsistence. Now-a-days, with our irresistible metals, with our terrible fire-arms, with our land cleared and cultivated for centuries, with all the resources which agriculture and commerce furnish us, we can live in peace the life of the civilised; but in those days, when immense forests, which the stone hachet was incompetent to fell, covered the greater part of the soil; when, in default of agriculture, man was compelled to seek a subsistence by the chase alone; when the immediate necessities of existence demanded a continual warfare against such animals as the mammoth; and lastly, when the hunting grounds, the sole resource of one tribe, would have to be defended against the incursions and attacks of neighbouring tribes—it behoved them, under penalty of disappearing from the face of the earth, to accommodate themselves to circumstances, and to live the violent life of barbarians. The Troglodytes of Les Eyzies were therefore barbarians, in common with all the human kind of their day, and we ought not to be astonished that such conditions should have been the cause of very marked impressions on the skeletons of these people. But these barbarians were intelligent and perfectible, and whilst continuing their struggle against nature and against their fellow-men, they managed to leave themselves sufficient leisure to increase their knowledge, to develop their industries, and even to elevate themselves to the cultivation of the arts. Such precious aptitudes, rare in all times, but truly extraordinary in regard of the period in which they were manifested, could only result in favour of an advance in cerebral organisation, such as that which has found a morphological expression in the skulls of the race of Les Eyzies.

What became of this race, so remarkable, which appears to us in the distant past like a bright light in the midst of darkness? In cultivating the arts which adorn life and render it enjoyable, did these people lose any of that warlike energy which alone could protect them against the ferocious aggressions of surrounding savages? And did they succumb, like those precursors who, having arrived untimely, disappear, oppressed to death by the incompatible media into which they have tried to introduce a pre-

mature progress? Or, indeed, surviving this inevitable struggle in which their civilisation has perished, did they escape extermination only to fall back into universal barbarism; and to lose in the long run under the influence of crossing, of social change, and of the gradual transformation of the fauna and of climate, the anatomical characters which formerly distinguished them? It is permitted to hope that future discoveries will furnish new elements for the solution of these important questions; but as yet we can assert one thing only—and that is, that the race of Les Eyzies is entirely different from any other race, ancient or modern, that we have ever seen or heard of.

NOTE.—Engravings of the skulls from the sepulchral cave at Les Eyzies have been published in the *Reliquie Aquitanique* of MM. Lartet and Christy, Part VI., with a text by Professor Broca; and the casts exhibited at the meeting have been since presented, by the Minister of Public Instruction in France, to the Christy Collection in London.

## FIFTH MEETING.

TUESDAY, AUGUST 25.

SIR JOHN LUBBOCK, BART., PRESIDENT, IN THE CHAIR.

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The Congress met at 11 A.M., when the following Papers were read :

ON THE MODES OF SEPULTURE OBSERVABLE IN LATE ROMANO-BRITISH AND EARLY ANGLO-SAXON TIMES IN THIS COUNTRY.

BY GEORGE ROLLESTON, ESQ., M.D., F.R.S.

(Linacre Professor of Anatomy and Physiology, Oxford.)

THE author began his paper by saying that the admission of a paper on the modes of interment adopted in this country during the fourth, fifth, and sixth centuries of the Christian era into the list of papers to be read before a Congress of Prehistoric Archæology, was an illustration of the truth of Mr. Goldwin Smith's remark, that place as well as time could confer a prehistoric character on events.* The positions taken up in his paper were mainly, though not exclusively, based upon investigations conducted by him in a cemetery at Frilford in Berkshire, belonging to Wm. Aldworth, Esq. Interments to the number of 123, and of five different kinds, have been taken note of in this cemetery alone. Two of the five kinds of interments were Roman or Romano-British; and the remaining three Anglo-Saxon. The first kind of interment was that of leaden coffins, rectangular in shape, covered with a lid, occupying deeper graves

* For the non-historic character of this period in Great Britain see Kemble, 'Saxons in England,' i. 22, 28; Gibbon, chap. xxxviii. vol. vi. ed. 1838, *ad fin.*

than any of the other interments, more or less accurately oriented, sometimes containing coins, as of the Emperor Gratian (ob. 383), and sometimes not. The presence of large nails, with woody fibre still adherent to them, which microscopic examination had shown to be oaken, in relation with these coffins, went to prove that the leaden coffins had been surrounded with wooden ones when put into the graves.*

The second kind of interment, also of Romans or Romanised Britons, resembled the first in being more or less perfectly oriented, the orientation varying, probably accordingly as it had taken place in summer or in winter, from E.N.E. to E.S.E. over about 45°; † and in having had a wooden coffin, to the existence of which nails with oaken fibre and iron hooping enabled one to argue—and finally in having coins in relation with the upper parts of the skeleton. The main difference between this and the former kind of interment was the absence of the leaden coffin, which probably corresponded then, as now, to a greater command of wealth. In this second kind of interment the ‘shards, flints, and pebbles,’ of which the Priest in Hamlet (act. v. sc. i.), speaks in a now often quoted passage, ‡ were very ordinarily found. From the

* For descriptions of similar interments in leaden coffins see Abbé Cochet, *Normandie souterraine*, p. 29; Professor Phillips, *Yorkshire*, p. 249; Bloxam, *Fragmenta Sepulchralia*, p. 30, 39; Thoresby, *Phil. Trans.* 1705, vol. xxiv. No. 296, p. 1864.

† See l'Abbé Cochet, *Normandie souterraine*, p. 192.

‡ Douglas, in the *Nenia*, p. 10, is, so far as I know, the first who called attention to this passage of our great poet as illustrating the very commonly to be observed presence of ‘shards, flints, and pebbles’ in graves, into which it is difficult to think they could have got by accident. At p. 10, and also at p. 34, Douglas records the presence of these matters in graves of Anglo-Saxons. Mr. Wylie has also noted the same fact (see *Fairford Graves*, p. 25). Now, we have Mr. Kemble's very great authority (*Horæ Ferales*, p. 98) for saying that all (Anglo-Saxon) burials without cremation in England are Christian. Hence we may infer, as indeed we may also from the presence of these fragments so constantly in the Romano-British oriented graves, that, though the custom was considered heathenish in the days of Shakspeare and Queen Elizabeth, it was acquiesced in as allowable by Christians in the days of Cædmon and Queen Bertha. Indeed our own custom of throwing in ‘earth to earth, ashes to ashes’ may be derived from this practice. Keller, in some valuable remarks upon this custom in the *Mittheilungen der Antiquarischen Gesellschaft in Zürich* (iii. 1, 1845, p. 65): *Allgemeine Bemerkungen über die Heidengräber in der Schweiz*, observes that it would be well if the English antiquaries would decide whether this custom is to be referred to a Celtic or a Saxon

position these fragments occupied relating to the skeletons which, as just observed, were interred in coffins, it is evident that they must have produced a loud and harsh sound when thrown into the grave. Fragments of charcoal also were found in some of these graves.*

The author is convinced that Keller's words (l. c. 95) apply to the two kinds of interment described: 'Betreffend die jüngsten unter den alten Grabstätten, die sogenannten Reihengräber, ist schon früher bemerkt worden, dass die nicht nur in der östlichen und westlichen Schweiz, sondern auch in Süd-Deutschland und Frankreich häufig vorkommenden Begräbnisse dieser Art ohne allen Zweifel von

origin. It is certainly difficult to think that the Celts of England borrowed this practice from the Saxons, but it is just possible that it may have descended to both nationalities from their common Aryan forefathers. I may remark that in the Romano-British graves, fragments of thoroughly well-baked and lathe-turned pottery were found, and not merely the imperfectly burnt fragments of which Keller speaks as exclusively found in the heathen interments. See also Weinhold, Sitzungsbericht Kais. Akad. Wiss. Wien. 1858, bd. xxix. hft. 1, p. 166. I have myself looked through a very large number of memoirs and dissertations upon funeral rites without finding anything which casts much light upon the relation which this custom holds to certain somewhat similar performances put in practice at funerals either in ancient or modern times. The following passage, however, it may be well to quote: though, as it comes from a production intended to ridicule an epieure, to whom a *batterie de cuisine* was his *instrumenta artis*, and as the author may have forgotten that the Romans did not, though other nations did, bury the dead man's favourite weapons with him, its value is less than it otherwise would be. In the *Funus Parasitium*, sive L. Biberii Curculionis Parasiti Mortualia. Ad ritum prisce Funeris, auctore Nicolao Rigaltio, Lubeccæ mdcxxxvii., I find the following incident as taking place: 'Dum quisque certatim in rogum dona cumulat, et partim *trullas, cantharos, lanceas*; alii *struices patinarias, cyathos, ciboria, coquinaria omnia*, flammæ committunt.' This is what did take place in the interments of Celts and Saxons of both Romanised and Christianised tribes, and of heathen races. But this passage, I fear, scarcely proves that the custom was practised by heathen Romans.

* Keller (l. c.) observes that he has found charcoal in graves where no signs of a fire having been lighted in the grave can be discovered, and that he is inclined to ascribe the scattering of this substance, as also that of the shards, into the graves to some unknown burial custom. There is also a passage in the *Ritual of Durandus* which throws some light upon this matter, and more, as I think, than the often quoted one, *Div. Off.* vii. c. 35; see *Archæologia*, xxxvi. p. 23, xxxix. p. 143; *Horæ Ferales*, 101. This passage is to be found in the *Rationale Duranti* (Vicentiae, 1480), vii. ccv.; *Rubrica*, p. 207: *Carbones in testimonium quod terra illa in communes usus amplius redigi non potest; plus enim durat carbo sub terra quam aliud.*

den aus Celten, Römern und germanischen Stämmen entstandenen Mischvolke herrühren, und der Mehrzahl noch Zeichen des christlichen Glaubens in sich schliessen.' The third kind of interment of which examples had been brought under the author's notice, were as assuredly or indeed more certainly heathen than the two already described were Christian, being, as they were, burials in the way of cremation, against which Christianity* had protested from its earliest days down to a period as late as the thirteenth century. Eight urns, two of which had the now well-known Anglo-Saxon patterns upon them, familiar to us from the 'Horæ Ferales' and the 'Saxon Obsequies' at Little Wilbraham, had recently come into the author's hands from the cemetery at Frilford; three of these eight urns were placed superficially in the soil to skeletons of Roman Britons in the *Reihengräber* already described. One of these three urns

* Very much of the subsequent history of this country, and indeed, I am inclined to think, the fact of our speaking, not a Romance but a Teutonic language, is to be explained by the fact of the paganism of our Anglo-Saxon conquerors. The clergy were the depositaries of literature in those centuries; and, with the destruction of their influence by the influx of vast numbers of heathens, the language which they used lost its hold on the population they were forced to desert. That the influence of the clergy, and, indeed, of the Christian religion, was destroyed during the period, and over the area, of Anglo-Saxon urn-burial, is deducible from the fact that Christianity has always resolutely fought against cremation. So Tertullian, A.D. 197, cit. Grimm, Berlin. Abhand. 1849, p. 207: *Christianus cui cremare non licuit*; see also History of Esthonians, as lately as 1210, A.D.; Grimm, *ibid.* p. 247; Pusey, *Minor Prophets*, Amos, vi. 10, *ibique citata*; Kemble, 'Horæ Ferales,' p. 95: 'Wherever Christianity set foot, cremation was to cease.' It is well to know, from the lament of Bede (*Hist. Eccl.* i. p. 22), as well as from the sneer of Gibbon, that the British Christians stood aloof from their pagan conquerors. It is not always recollected that the same line of conduct was persevered in by the conquered race for generations after the conversion of their masters, with the effect, of course, of giving their language the better chance in the struggle for supremacy. Bede's words, relating to his own time, are (*Hist. Eccles.* vol. ii. p. 20): 'Quippe quum usque hodie moris sit Brittonum fidem religionemque Anglorum pro nihilo habere, neque in aliquo eis magis communicare quam paganis.' Gibbon (vol. vi. ed. 1838, p. 376, chap. ix., and vol. viii. p. 156) explains the victory won in England by the Anglo-Saxon language; firstly, to the slight hold which he supposes Roman civilisation to have obtained here; and secondly, by the greater relative numbers of the Anglo-Saxons as compared with the numbers of the kindred Gothic races who lost their languages, and adopted in due time those of the Latin races they subdued. The first of these explanations is not a *vera*, the second not a *sufficiens causa*.

was a patterned urn, the other two were plain. No doubt therefore could exist as to the nationality of the tenants of the urns, nor as to the earlier date of the interments underlying them. Urns of the same character as those found at Frilford had been found now in as many as fifteen counties in England;* and inasmuch as cremation and urn burial could have been practised by the Anglo-Saxons, on account of the opposition the Christian authorities made to it, only during the period of their heathendom, *i.e.* during the 150 years intervening between the comings of Hengist and of St. Augustine, a clear proof was furnished to us that the Anglo-Saxons came over in great numbers. Otherwise these urns would not have been so numerous. The fourth kind of interment, which was the second kind of Anglo-Saxon interments, was interment with relics, in shallow graves, without any apparent regard to the points of the compass. The relics were the well-known ones now universally recognised as Anglo-Saxon, and were represented on various diagrams. Fibulæ in pairs, beads of glass and of amber, long bronze pins, scoops and pickers, had been found with female skeletons; spears, umbones, knives, and in one case a buckle, had been found with male skeletons. All these objects were

* Since the publication of Mr. Wylie's paper in the *Archæologia* (vol. xxxvii. 1858), in which paper examples of Saxon cremation were given from fourteen counties in England, many similar 'finds' have been put on record. By the discoveries at Frilford, Berkshire is added to the list given by Mr. Wylie. A considerable number of Anglo-Saxon urns were dug up just outside the city of York by F. W. Calvert, Esq., in 1859, and added to the museum there; and it is of importance, as showing how entirely England proper was overrun by these invaders, to say, what has not been said before, that an urn of precisely the same style of ornament may be seen in the library of Queen's College, Oxford, which in all probability came from Faversham, on the Watling Street, between Chatham and Canterbury. It is the fashion to consider Hengist a mythical person, and to disregard alike the story of his landing in Kent, and of his being executed at Conisborough in South Yorkshire. But these urns show that men such as Hengist did spread themselves over the very area which he is said to have overrun; possibly not in so short a period as the forty years assigned for his exploits, but, what is of greater consequence, without giving up the manners and customs and creed of the country whence they came, and in which, at the present day (see *Horn Ferales*, Pl. XXX. *et passim*), we find similar relics to those of which we have been speaking. A very large 'find,' of what I cannot but think are Anglo-Saxon urns, is put on record in the *Illustrated London News* for January 25, 1868, as having taken place at Melbourne in Derbyshire.

drawn: one of the spears had the corrugated blade mentioned in the Introduction to Mr. Akerman's 'Pagan Saxondom,' as having been noted in the similar implements used by the Hottentots; the scoops and pickers were such as may be seen figured in the work just cited, pl. xxxv. fig. 4; or in Mr. Wylie's 'Fairford Graves,' pl. ix. fig. 10; the pin similar to those figured in 'Pagan Saxondom,' p. 71, pl. xxxv. fig. 5, 'Archæology,' 35, 477. No swords, and, so far as Professor Rolleston's researches had gone, no holy water vessels, had been found *in situ* at Frilford. Mr. Akerman, however, has recorded the discovery of one of the latter relics *in situ* there, and another and a very beautiful one is preserved in the British Museum. The graves of the heathen and the half heathen Anglo-Saxons were, it was well known, shallow graves, as were also those of others of the great Gothic family in a similar state of culture or absence of it.* At Long Wittenham the very numerous Anglo-Saxon interments described by Mr. Akerman in the 'Archæologia' (vols. xxxviii. and xxxix.), were mostly directed towards the south-west. No rule could be laid down for this class of Anglo-Saxon interments at Frilford. The shallowness and other peculiarities of these graves seem to speak to a certain carelessness in the persons concerned in forming them; and the author may perhaps be permitted to say here that, in a grave of this kind examined subsequently to the reading of this paper, an Anglo-Saxon man was found with his face downwards, overlying some iron fragments of probably an umbo and also a knife. The Anglo-Saxons, like the Jews, buried without coffins, and bearers drunken from the funeral feast might readily make such a mistake as this. It is fair, however, to say, that the author has found Romano-British bodies similarly 'pronated,' perhaps from a similar cause. But perhaps the proverb, 'exceeding sorrow is exceeding dry,' applies to a good many other races beside the Celtic and the Teutonic, to whom it seems to him to be equally applicable, at least in modern times. This fourth kind of interment may

* See Hon. R. C. Neville, *Saxon Obsequies*, Little Wilbraham, 1852; J. Y. Akerman, *Archæologia*, vol. xxxvii. 1856, p. 113; l'Abbé Cochet, *Normandie souterraine*.

perhaps belong to the period of transition from cremation and heathendom to Christianity; and to this latter period the fifth kind of interment, the third of the Anglo-Saxon varieties, may be referred. This fifth kind is seen to be Anglo-Saxon* by the relics, and to be Christian by the orientation, and by the greater care and pains bestowed upon it. The Anglo-Saxons in this phase of their progress buried their dead in the graves of the Romano-British, but set on either side and at either end of the grave either large stones or Roman tiles.† They do not seem to have had any scruple as to disturbing the bodies in previous occupation, and, as this remark shows, they took more trouble than in the kind of inhumation without orientation, inasmuch as their graves were now dug deeper.‡

The author ends his paper by enumerating some of the

* Christianity opposed itself, though not so uncompromisingly as to cremation, still more or less persistently to the practice of burial with weapons and gorgeous raiment. Nevertheless Weinhold tells us (*Altnordische Leben*, p. 493) that, till within a generation of the present time, the dead in Sweden were buried with their tobacco-pipes, their pocket-knives, and sometimes with their brandy-flask filled and placed by their side! Lindenschmit (*Alterthümer unserer heidnischen Vorzeit*, hft. ii. bd. ii. and taf. vi.) says that the Alemanni retained these customs long after the time of St. Boniface and St. Pirminius. Charlemagne, Probus, and Proba Falconia, had much gold buried with them, though they would have freely and fully acknowledged that they brought nothing into the world and could take nothing out. It is strange, certainly, that in a passage from the *Capitularia Regum Francorum* (vol. ii. p. 852), as to the burial with ornaments, &c., it should be said, '*Mos ille in vulgo obsoletus, in funeribus episcoporum et presbyterorum retinetur*;' see also p. 701. The gorgeously arrayed corpse of Pope Adrian I. was plundered of its decorations by the very persons who least should have so treated it. See Mabillon, *Mus. ital.* i. 41. See Bloxham (*Fragmenta Sepulchralia*, p. 67) and l'Abbé Cochet (*Normandie souterraine*, p. 194), for discontinuance and retention of the practice.

† For employment by Teutonic races of Roman tiles in burial, see Wanner, *Das Alemannische Todtenfeld bei Schleithelm*, p. 13; Lindenschmit, *Arch. für Anthropologie*, ii. 3. p. 356. For setting of stones round graves, see V. Sacken, *Leitfaden zur Kunde des heidnischen Alterthumes*, p. 154.

‡ It is a little remarkable that, in the face of the words of Sidonius Apollinaris, *Epist.* iii. 12 (cited by Grimm in his paper, *Ueber das Verbrennen der Leichen*, Berlin, *Abhand.* 1849, p. 269): '*Jam niger cæspes ex viridi, jam supra antiquum sepulchrum glebæ recentes*,' the Abbé Cochet should have written, (*Normandie souterraine*, p. 185, *prem. éd.*), '*L'usage d'enterrer plusieurs fois au même endroit est éminemment moderne*.' In the second edition of this valuable book, however (see pp. 209, 432-436), the Abbé has receded from this position. see also his *Tombeau de Childéric*.

points of contrast and of coincidence between the Anglo-Saxons whom he had exhumed, and the other Teutonic tribes as described by l'Abbé Cochet and Lindenschmit and others. If Maurungania, the country of the Merovingians, is really to be found, as has been suggested (see Mascou, cit. Ecker, 'Crania Germaniæ Occidentalis,' p. 89), in Holstein, the Frank and the Angle must at one time have been very closely affined. Dr. Rolleston suggests that Layamon and those who have followed him have called Gurmund an African from having, stupidly enough, confounded Maurungania with Mauretania! They showed ἡθεα ὁμότροπα in both alike disliking towns and living camp-lives, so to say, in the country. 'Ipsa oppida,' says Ammianus Marcellinus (16. 2) of the Saxons, 'ut circumdata retiis busta declinant.' See Pearson, 'History of England,' i. 264; Coote's 'Neglected Fact,' p. 123; and Gibbon (chap. xxxviii. vol. vi. p. 336, ed. 1838), speaks in the same terms of the Merovingians as Tacitus had long before ('Germania,' 16) spoken of all the Germans in the words, 'Nullas Germanorum populis urbes habitari satis notum est.' See Julian, 'ad Athen.' p. 278; Thierry, 'Récits méroving.' ii. 363; Ukert, 'Gesch.' p. 204; Klemm, 'Germ. Alt.' p. 114, cited by Orelli in loc. Thirdly, the words *utilis Gothus imitatur Romanum* ('Excerpta Auctoris ignoti,' p. 61, cited by Coote, 'Neglected Fact in English History,' p. 44) apply alike to all the Teutonic races. The most characteristic Anglo-Saxon patterns have been found on Samian ware by the author. Though the material and the processes employed in working it up had been wholly different, the type was the same for both, and of course the Anglo-Saxon had been the copyist. The employment of Roman tiles, and the adoption of the Roman custom of placing coins with the corpse in burial, were smaller matters pointing in the same way, and throwing some rays of light upon the somewhat obscure subject of the continuity of Roman influence in the shaping of our present laws and our present municipalities. See Coote's 'Neglected Fact in English History,' *passim*; Pearson's 'History of England,' i. pp. 44, 103; Savigny's 'Geschichte des römischen Rechts im Mittelalter.' For authorities on the other side to that taken by these writers (with whose conclusions, however, persons who are familiar with Anglo-

Saxon and French antiquities, and who think, with the author, that a certain degree of material culture is a prerequisite for the possession of civilisation, will agree), see Merivale, 'Conversion of the Northern Nations.' The early age at which the Franks died has been forcibly commented upon by l'Abbé Cochet ('Normandie souterraine,' p. 183), and the author said that the same was most strikingly the case with the Anglo-Saxons he had disinterred. Blood-thirstiness was, according to Salvian, a characteristic of the Saxon, and deceitfulness of the Franks; and from the Capitularies of Charlemagne we were made acquainted with the drunken habits of the former of these races. Here were *veræ causæ* enough for shortlivedness. In the cemetery at Frilford, the youth of the Anglo-Saxon skeletons was brought into relief by the great age of a great number of the Romano-British bodies. Of these last it may be remarked, that the most usual deviation of their orientation was southward, a fact which may point to their having died, as the aged do, in greater numbers in the winter than in the summer. This contrast as to length of life puts Anglo-Saxon civilisation at a great disadvantage as compared with Roman, as indeed the contrast as to material comfort, as still testified to in this neighbourhood, does also in the style of pottery, &c. The great point of difference between the English and the two continental races of Teutons referred to was the retention of cremation so much longer by the former. Some minor points of difference the author had noted between the interments he had identified as Anglo-Saxon and those assigned to the Franks by Cochet and the Germans at Selzen by Lindenschmit. The urns of the English cremations were not lathe-turned; those of the Selzen inhumations were. See Lindenschmit, 'Germanische Todtenlager bei Selzen,' p. 15. But when holy water vessels had been observed at Frilford it was at the shoulder, at Fairford they were under the body, at Brighthampton at the head; the Frankish and Selzen were at the feet, and were constantly, and not as with the Anglo-Saxons only occasionally, found. Lindenschmit's remark as to the absence of the patellæ, Professor Rolleston thought must be based upon some 'fallacy of simple inspection.'

ON THE ANTIQUITY OF THE IRON MINES OF THE WEALD.

By W. BOYD DAWKINS, Esq., M.A., F.R.S.

FEW perhaps, as they go by train from Tunbridge to Hastings, through the well-wooded, sparsely-populated country, now plunging into a tunnel, now looking down a valley from the top of an embankment, realise that they are in the midst of what was not very long ago the principal iron district in England. The large woods, the green fields, the quaint old houses, contrast so strongly with the dense population, the clang of forges, and the large barren cinder-heaps of the black country, that it is hard to believe that the weald of Kent and Sussex at one time stood at the head of our iron export trade, or that the last furnace grew cold but some forty years ago; yet the facts are beyond doubt. Mr. Lower, the eminent Sussex antiquary, has traced the mediæval history of the iron works of Sussex, in a valuable series of papers, published by the Archæological Society of that county, and the Rev. E. Turner has proved that they have probably been worked since the time of the Roman occupation of Britain. The evidence that came before my notice, while I was engaged in the geological survey of the district in 1862, seems to point towards their being of a far higher antiquity. The extent to which the ironstone has been worked can only be realised by a careful survey. The old pits lie so closely together, and are so universally found wherever the ironbearing stratum occurs, that it is almost possible to map the latter by their indications alone.

We will first of all indicate the position of the layer of ironstone in the geological scale. Resting on rocks of marine origin, that contain all kinds of waifs and strays of marine life, is the large series of clays, lime and sandstones, twelve hundred feet thick, that occupy the area of the Weald.

It was deposited in the ancient estuary of a river that drained some great unknown secondary continent. About its middle is a stratum, termed the Wadhurst clay, which furnished the two thin bands of ironstone, from which all the iron was obtained. These bands are not continuous layers, but consist of nodules, in each of which is a fragment of bone or wood, or masses of fresh water shells, around which the ore has been deposited. The shells are of the same familiar forms as those now living in our rivers—*Paludina*, *Unio*, and *Cyclas*. The fragments of wood belong to the fir tribe, and to the same family as the tree ferns of Australia and New Zealand; while the remains of the animals belong to the crocodiles, monstrous lizards, allied to the *Iguana* and *Monitor*, to the long-necked *Plesiosaur* and the short-necked *Ichthyosaur* that, in a world in which the class *Reptilia* were dominant, occupied the position and rivalled the bulk of whales. On the top of this great mass of river deposits lie the cretaceous rocks, of which the North and South Downs are mere tatters spared by the rains and frosts of countless ages. Plutonic action has been very rampant throughout the Wealden area, tossing rocks up and throwing them down, and twisting them about in almost every conceivable manner. A few coloured sheets of paper torn to pieces and then crumpled up and squeezed into a solid mass, will give an adequate idea of their condition before they were brought under atmospheric influences. If we cut valleys in miniature out of the mass of paper, the coloured fragments exposed in their sides will represent most accurately the disconnected surfaces of the rocks, laid bare by rain, frost, and the erosive action of the streams. The iron-bearing stratum, therefore, does not now form one continuous mass, but is scattered about in patches, from Tunbridge on the north to Hastings on the south, and from Horsham in the west to the old port of Winchelsea in the east. Throughout this district are the traces of the old works, consisting of the old embankments of the hammer-ponds, large heaps of scorïæ, and the mine-pits, as they are termed, from which the ore was obtained.

The mine-pits are small circular or oval depressions, from three to six feet wide and from six to eight feet deep. They

consist of partially filled up shafts, which varied in depth according to the thickness of the clay above the ironstone, from seven or eight to forty feet. They lie very close together, and are now very generally overgrown with trees; and as the ground they occupy is very much broken up, it is not yet brought under cultivation. The method of mining was to sink a shaft down to the ironstone, to remove as much ore as was within reach, then the shaft was partially filled up, and the operation repeated; and for this reason the mine-pits are so numerous and so close together, that they bear a strong resemblance to the hut-circles within Celtic and Roman forts, such as those of Pen-knowle near Wells, Worle Hill near Weston-super-Mare, Brent-knowle in Somerset, and Penselwood on the Somerset border of Wilts.

The first historical notice of the Wealden ironfield is to be found in a grant of Henry III. to the town of Lewes after the battle, of a toll of one penny on every cart laden with iron. From that time there is evidence that the iron trade gradually became of more and more importance. Tombstones, horse-shoes, tires for wheels, and andirons, were the staple manufactures. The first cannon cast in England was made at Buxted, in 1543, a hamlet about two miles from the beautiful little town of Uckfield; and it created such an interest at the time, that the names of the founders are still handed down by tradition. Ralph Hogge, or Hog, was the iron master, and Hugget was the founder; the furnace in which it was cast was Hugget's furnace.

Master Hugget and his man John,
They did cast the first cannon.

The first mortar also made in this country was made at Eridge Green. Fuller bears testimony to the importance of the gun manufacture in his time. 'It is almost incredible,' he writes, 'how many great guns are made of iron in this county (Sussex).' In the seventeenth century it reached its most prosperous stage; and so important were the ironworks considered in the Civil War of 1643, that all those belonging to the crown, or to royalists, in West Sussex were destroyed. Up to the end of the seventeenth century the iron trade continued to flourish, and even in 1724 it was considered

in Sussex, according to Mr. Lower, the chief interest in the county. At the beginning, however, of the eighteenth century, a cause which had frequently been felt before and provided against by many legal enactments, made itself seriously known—the scarcity of fuel for the smelting of the iron. As far back as the year 1543 an order was issued that no wood should be turned into pasture. After this date the growing scarcity of wood was again and again brought before the notice of Government, but to no purpose. Nearly all the large timber trees had already been cut down in the great Wealden forest, until at last the increased cost of the charcoal compelled the Wealden iron-masters to shut up their works. Some of them, indeed, during the reign of Henry VIII., had already migrated to South Wales, where they founded the extensive iron-works at Aberdare and Merthyr Tydfil. The iron foundries of South Wales, therefore, may be considered in part the offspring of those in the Weald. The decline rapidly went on during the seventeenth and eighteenth centuries, and was very much accelerated by the Civil Wars. ‘In 1653 there were twenty-seven furnaces in Sussex, of which ten were abandoned before 1664, and partly ruined, but repaired and stopped on account of the war and hopes of encouragement, seven ruined and not rebuilt,’ and there were also ‘forty-two forges, of which nineteen were ruined before 1664 and so remain; five laid aside, and eighteen continue in hopes of encouragement.’ This return is taken from a transcript of a paper found at Horsham, and published by Mr. Lower in the Sussex archaeological collections. Thus there is clear evidence that within eleven years at least one-half of the iron trade had left the Weald. The furnaces after this became fewer and fewer: in 1740 they were reduced to ten, in 1788 to two, and in 1796 there was only one forge left in Sussex, at Ashburnham near Battle, which furnished 173 tons of iron in that year. Thus, gradually, during the latter half of the eighteenth century, the black forges of Sussex crumbled away, the sterile ash-heaps became overgrown with green moss and long rank grass, the ground covered with impenetrable thickets of black thorn, hazel, ash, and alder, and the rude clang sounded less

and less frequent, until in 1825 that of Ashburnham became silent, and the iron mines of the Weald were abandoned.

By far the greater number of the mine-pits were doubtless made during the six hundred years of which we have given an outline, from the time of Henry III. downwards, but some of them can be carried back at least as far as the Roman occupation of Britain. Thus in 1844 Samian and other Roman ware, a bronze fibula, and other objects undoubtedly Roman, were found by the Rev. Edward Turner in a mass of scoriæ, covering an area of from six to seven acres, to a depth of from two to ten feet, in the parish of Maresfield near Uckfield. Among other objects were coins of Nero (A.D. 64 and 68), Vespasian (69 and 79), Tetricus (274), Diocletian (234–236). The predominance of the coins of Vespasian leads Mr. Lower to the conclusion that the works were in operation in the time of that emperor, or his successor Titus. From the admixture also of coins of different dates, the long continuance of the works may be fairly inferred. Similar discoveries of coins at Chiddingly near Hailsham, and at Seddlescombe near Battle, prove that the mines were very largely worked during the Roman occupation. There appears also to be presumptive evidence that they were worked before the landing of Cæsar. In 1862 I found on the surface of a cinder heap, to the north of Bathurst Wood, near Battle, fragments of rude, unturned pottery, identical in coarseness of texture, and in the presence of little fragments of quartz, with that usually termed Keltic. There were also rude flint flakes, which must have been brought there by the hand of man, because the material is foreign to the area. I met with flakes also in association with the scoriæ at Seddlescombe. It is indeed undoubtedly true that rough pottery, unturned in the lathe, and flint flakes, were used in Britain during the Roman occupation. Both occur along with Samian ware, bronze fibulæ, and the like, round the Roman castrum at Hardham near Pulborough, which I explored in 1863. Both most probably were used by the peasantry long after the Roman conquest; but nevertheless, when they are found apart from any trace of Roman art, there is, to say the least, a possibility of their belonging to a far more ancient period. The possibility in this particular case widens and deepens

into a probability when we read in Cæsar's 'Commentaries' (book v. chap. 12), that the dwellers in the maritime part of Britain 'utuntur aut ære aut taleis ferreis ad certum pondus examinatis, pro nummo. Nascitur ibi . . . in maritimis ferrum; sed ejus exigua est copia.' In the fourteenth chapter he designates Cantium (Kent) as being wholly 'maritima regio;' and in the thirteenth he defines Cantium as being one of the angles of triangular Britannia, including most probably not only Kent, but also a considerable portion of eastern Sussex. Again, in the twelfth chapter, he says expressly, that the Maritima pars was inhabited by Belgic colonists, who crossed over from the country between the Seine and Marne and the Rhine; that is to say, from the nearest points of the Continent. All these passages taken collectively would imply that the maritime part in which the iron occurred was that nearest the Continent, or Cantium, *i.e.* Kent and Sussex. Now the recently published geological maps of those two counties show that the iron-bearing strata are found only in the extreme south of the present county of Kent and in the Wealden portion of Sussex. And therefore such a remark could only apply to that area. In full, to sum up the whole case, we find on the one hand, near Battle, scorïæ which may be ascribed to a date anterior to the landing of the Romans; on the other, we find Cæsar mentioning the fact of the occurrence of iron in that very district; and therefore we may fairly infer, that some at least of the mine-pits in that neighbourhood date back from a time anterior to the first Roman landing. The nearest mine-pits to the layer of scorïæ are those of Seddlescombe and Brede, those of the former place having been worked by the Romans.

It would indeed have been a most exceptional case had the conquerors of Britain, who worked the tin and copper of Cornwall, the lead and zinc of Somerset, and extracted gold out of the solid quartz rock of Wales, neglected to carry on the works begun before their landing.

Direct proof that mining was carried on in the Weald some nineteen hundred years ago we cannot get, but the evidence tending towards that conclusion seems to be worthy of notice. The faintest glimmer of light thrown upon those very obscure times should be treasured up.

ON THE MANUFACTURE OF STONE IMPLEMENTS IN
PREHISTORIC TIMES.

BY JOHN EVANS, Esq., F.R.S.

(*Abstract.*)

As the contents of this paper will form part of a work on the Stone Antiquities of Great Britain, which it is hoped will shortly be published, it is here given only in abstract. After remarking that the best method of ascertaining the mode of manufacture of stone implements in ancient times was by observing the processes employed by modern savages in the production of similar implements, and also those adopted by the workers in flint of the present day, Mr. Evans entered into a detailed account of the manufacture of gun-flints as still conducted on an extensive scale in Norfolk and Suffolk. He then explained how, by the use of an ordinary pebble held in the hand as a hammer, flint flakes might be struck from a block of flint, and suggested that, in the case of some of the delicately chipped small cores, such as occur occasionally in Yorkshire, the flakes may have been removed by the use of a punch, or set, as appears to be practised in some parts of South America in recent times. The process formerly in use in Mexico for the manufacture of obsidian knives, and those of the Australians and Esquimaux of the present day for making flakes, and arrow-heads of chert and flint, were next described, as well as the method by which the long flakes struck from the large nuclei so abundant at Pressigny le Grand were formed. The author next described the various methods in which stone hatchets, or celts of different forms, are chipped out, calling attention to the fact that the edges of some were produced by the intersection of two facets from which flakes had been dislodged in so skilful a manner, that a regularly curved or an almost straight edge

was left, so sharp as to require no grinding. He next gave some account of the ancient manufactories of flint implements which had been discovered at Spiennes, near Mons in Belgium, by Mons. Toilliez, and at Cissbury, near Worthing, by Colonel A. Lane Fox, and then proceeded to consider the various forms of flint implements into which flakes were converted by subsequent or secondary chipping. One of the commonest of these forms, the so-called scraper, he had found by experience could be readily produced by the use of a mere pebble as a hammer, but for the manufacture of arrowheads another process seemed to have been adopted. He described the method employed by the Esquimaux of chipping arrowheads by pressure with an 'arrow flaker' tipped with reindeer horn, and exhibited some flint tools found in Yorkshire, the ends of which were rounded and worn away as if they had been used in fashioning other flints. He had found by experiment that with such tools he was able to chip out arrowheads closely resembling ancient examples; but a much more efficient tool was one made of stag's horn, some of the arrowheads chipped out with which presented that 'surface-flaking' so characteristic of genuine specimens. By way of illustration he removed a number of minute splinters by pressure with the stag's horn tool against the edge of a flint flake. He confessed, however, that he was unaware of the method by which the long regular flaking on the surface of Danish spearheads and daggers and the minute ornamentation on the handles of the latter was produced. The next processes described were those of grinding and of boring the holes in perforated axes and hammers, which he considered could be effected in various manners, one of the most simple and effectual being by the use of a piece of wood charged with sand and water. In some cases, however, it appeared possible that the boring instrument was a bronze tube used in conjunction with sand. He exhibited a portion of an ancient Swiss hatchet through which he had bored a hole with a stick of elder and sand. The process of sawing, of which traces appeared on many ancient hatchets of fibrolite and jade, appeared to have been carried on in a somewhat similar manner; the saw having probably been a flint flake used in

conjunction with sand, or in some cases used by itself. In conclusion the author said, 'I can hardly quit the subject without just mentioning that here, as elsewhere, we find traces of improvement and progress both in adapting forms to the ends they had to subserve, and in the manner of treating the stubborn materials of which these stone implements were made. Such progress may not have been, and probably was not, uniform even in any one country, and indeed there are breaks in the chronology of stone implements which it is hard to fill up; but any one comparing, for instance, the exquisitely made axe-hammers and delicately chipped flint arrow-heads of the Bronze Age with the rude implements of the Palæolithic period, cannot but perceive the advance that had been made in skill and adaptation of means to end. Dividing the lapse of time embraced between these two extremes into four periods we find: 1. That in the Palæolithic or River-gravel Drift, Period implements were fashioned by chipping only, and not ground or polished. The material used was moreover, as far as at present known, almost exclusively flint. 2. That in the Reindeer, or Cavern, Period of Central France, though grinding was not practised, yet greater skill in flaking flint, and in working up flakes into serviceable tools, was exhibited. In some places, as at Laugerie, surface chipping is found on the flint arrow-heads, and recesses have been worked in other hard stones than flint, though no other stones have been used for cutting purposes. 3. That in the Neolithic, or Surface Stone, Period of Western Europe, other materials beside flint were used for the manufacture of hatchets, grinding on the edge and on the surface was generally practised, and the art of working flint by pressure from the edge was probably known. The stone axes, at least in Britain, were rarely perforated. 4. That in the Bronze Period such stone implements as remained in use were, as a rule, highly finished, many of the axes being perforated and of graceful form, and some of the flint arrow-heads evincing the highest degree of manual skill.'

ON THE PREHISTORIC SEPULCHRES OF ALGERIA.

BY J. W. FLOWER, Esq., F.G.S.

THOSE districts of Algeria in which prehistoric monuments are met with are, for the most part, so remote and difficult of access, and the study of archæology in that country is attended with so many other difficulties, that, until recently, little or nothing was known on the subject.

The result of my inquiries and observations, during a residence of several months, has satisfied me that a careful and extended examination of these remains cannot but be advantageous, as well on account of their intrinsic interest, as by affording instructive illustrations of other monuments with which we are better acquainted; and probably the subject will not be the less interesting to many members of the Congress when they are reminded that some of the most important investigations hitherto made originated with their lamented friend Henry Christy, and that by his labours in this almost untrodden field, he acquired an additional claim to the esteem of those who are interested in these researches.

The first—and indeed I believe the only—notice of these antiquities by any English archæologist, is to be found in an able memoir by Mr. A. H. Rhind, entitled ‘On the Vestiges of Ortholithic Remains in North Africa, and their Place in Primæval Archæology.’ This was read before the Society of Antiquaries in February 1859 and 1860, and is printed in the ‘Archæologia,’ vol. xxxviii. The only dolmens, however, which were described by Mr. Rhind, are those of El-Kalaa near Guyotville, being all that were then generally known.

In April 1863, Mr. Christy, in company with M. Feraud, spent several days in examining some dolmens near the road leading from Constantine to Batna. M. Feraud published a

short account of these explorations in the '*Recueil de Notices et Mémoires de la Société Archéologique de Constantine*' for 1863; and in the same volume is found an interesting account, by Captain Payen, of the circular tombs discovered by him in the Aurés and the plain of the Hodna, both in the province of Constantine.

Besides these various memoirs, Dr. Reboud in 1856 gave a short account in the '*Revue Africaine*' of some dolmens at Djelfa, resembling those at El-Kalaa; and M. Macarthy and M. le Commandant Bernard have given accounts in the same journal of some very interesting remains at Zeldou and near Tiaret in Oran. M. Feraud has published in the '*Revue Archéologique*' for 1865 an account of some further explorations in the province of Constantine. This comprises a valuable statistical account of those monuments furnished by the officers of the '*bureaux arabes*.'

After the appearance of these notices, the subject seems to have excited the attention of several able archæologists; and, since I left Algiers in February last, General Faidherbe, commandant at Bona, has published in the '*Bulletin de l'Académie d'Hippône*,' an able and elaborate paper on '*The Megalithic Tombs of Roknia*.' A letter from M. Letourneux to M. Desor, '*On the Funeral Monuments of Western Algeria*,' has also been printed in the '*Archives d'Anthropologie*,' published at Brunswick. M. Bourguignat, the eminent malacologist, has published a short work entitled '*Monuments symboliques de l'Algérie*;' and Dr. Bertherand and Dr. Bourjot have also contributed to the proceedings of the '*Société de Climatologie*' of Algiers a paper on '*The Dolmens of Beni-Messous (El-Kalaa), near Algiers*.'

These various memoirs comprise, I believe, all that has been published on the subject, and from them, as well as from information derived from General Faidherbe and M. Letourneux, and to some extent from personal observation, I have been enabled to prepare the following account of some of the dolmens and other prehistoric burial-places of Algeria.

In some respects these monuments will be found to present striking correspondences with those of England and

Wales and France, while in others they exhibit most remarkable differences, consisting chiefly in their infinitely greater abundance, a far greater variety in construction, and, in some places, an order and arrangement entirely unknown elsewhere.

With regard to their numbers, all who have visited them agree in stating that they are astonishing. General Faidherbe speaks of 3,000 tombs in a single necropolis at Roknia, and of another equally extensive within a few leagues of Constantine. M. Feraud says the dolmens and cromlechs extend for leagues; that in the plains, as on the mountains, the country is covered with them; that in three days he and Mr. Christy examined more than a thousand; and that, in the mountains and slopes, they were found wherever it was possible to place them. M. Payen relates that, in certain localities, the circular tombs known as *chouchas* occur in such vast quantities that at Djebel Keroubas he found 2,000 to 3,000; at Driecen they could be counted by thousands; and that at the foot of the Aurés is a place known to the Arabs as 'Bel-Kernin,' that is, 'the hundred thousand low (or little) towers.' M. Bourguignat says, that on the plateau of 'Sersou' the surface is covered with dolmens, in groups and singly. M. Létourneux describes the province of Constantine as '*constellée*' with them; and it is only within the last few days that I have received news from Algiers of the recent discovery of a vast dolmen necropolis in the district of Oued-Zenuto.

Nor is the arrangement of some of these monuments less remarkable than their abundance; the circular or tower tombs are found sometimes isolated, and occasionally ten or twelve feet apart from each other, in groups. In certain localities, the summits and ridges of the hills are covered with them, whilst on the edges of steep cliffs they form fringes overhanging the ravines. M. Feraud has described a series of cromlechs and dolmens extending for more than two miles in one direction across the plain. They are linked together by lines formed of large upright stones, about a foot and a half thick. These lines are sometimes single, but more usually double or treble, forming avenues or alleys, and they

serve to connect the tombs with each other, just as a thread holds together the beads of a necklace.

As might be expected, since these monuments are found in such vast numbers and extending over districts far remote from each other, several varieties of structure are met with. So far as hitherto known, they may perhaps properly be classed (at least provisionally) as follows:—

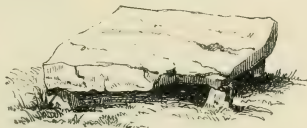
1st. Dolmens, covered and uncovered; the latter found at El-Kalaa or Guyotville, and also between Constantine and Batna, and the former on the plain of Sersou. 2nd and 3rd. Bazinas and Chouchas, both alike found in the Aurés and Hodna. 4th. Haouanet or rock tombs, found at Gastal, Roknia, and elsewhere. Several other varieties occur, which however, at present, do not appear to be of sufficient number and importance to require a distinct classification.

Near Constantine, and also at El-Kalaa (about twelve



DOLMEN AT GASTAL, CONSTANTINE.

miles from Algiers), all the dolmens are open, and are as nearly as may be of the same form and about the same dimensions as those found in Germany, in the west of France, occasionally in England, and more often in Wales. They are usually composed of four, five, or six stones placed on edge, in a rectangular form, two or three feet above the surface, with a capstone of about



DOLMEN AT AIN GUEBER.

six or seven feet by four or four and a half feet wide; the chambers or tombs are usually about two and a half feet deep, two feet ten inches wide, and five feet six inches, or six feet,

long. Occasionally, however, they are of much larger dimensions; M. Feraud describes one near Batna, of which the capstone was twelve feet by seven feet wide, and one and a half thick.

At El-Kalaa the number of dolmens is now only about sixty or eighty; formerly there were many more; no traces are here visible of cromlechs or circular inclosures, but these may have been removed by the Mahonnese colonists who now cultivate the land.

In other localities, the dolmens are seen to be inclosed by a cromlech, or circle of upright stones of varying dimensions,



SQUARE CROMLECH, DRIECEN.

the dolmen being usually placed in the centre, but not seldom it is found just inside the circular inclosure. Frequently, however, dolmens are found without cromlechs, as cromlechs are sometimes seen without dolmens. These inclosures are found sometimes round, sometimes square, and occasionally ellipsoidal, and, when they occur on the slope of a hill, a

platform has been formed for them by building up a wall on the lower side.

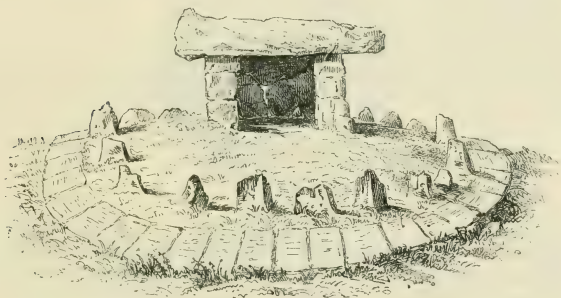


CIRCULAR CROMLECH, ALGERIA.

These inclosures are of various forms. One was found of three concentric angles of large upright stones, the diameter

of the outer circle being forty feet. In the centre was a pit formed by a double row of stones, the opening had no capstone, properly so called, but was closed by several large stones. At the depth of four feet was a bed of smaller flagstones, and under this the remains of the skeleton were seen lying on the rock.

At Tarf, a dolmen is found in a marsh surrounded by a circle of upright stones, and this circle is in its turn encircled by a pavement of flagstones perfectly well squared; and on the road from Guelma to Constantine a dolmen has been



DOLMEN AND CROMLECH, TARF.

discovered surmounting several concentrical rows of steps of hewn stone. This monument is figured in the work published by the French Government, entitled '*Exploration scientifique de l'Algérie, Archéologie,*' pl. 161. It seems to be a combination of the dolmen with the bazina, which will presently be described.

The several forms of dolmens and cromlechs above described exhibit correspondences, more or less close, with European forms: it remains to speak of some which seem to be unlike any that are known elsewhere. These have been described by Captain Payen and also by M. Letourneux, and it is from their accounts, and from the notes and drawings which M. Letourneux has kindly furnished me, that I am able to describe them.

These remains have hitherto been chiefly found around the Aurés in the plain as well as in the Hodna, both in the province of Constantine, but doubtless they will be met



BAZINA, PLAIN OF AURES.

with abundantly elsewhere. They are of entirely different forms, and usually found apart from each other, but sometimes they are seen combined. One is called by the Arabs

bazina, from its resemblance to a hillock, the other is called *choucha* (plural *chouchet*), from its resemblance to a Tunisian fez, or skull-cap. One of the places in which they are found in great profusion, is indeed known as '*Chouchet-er-Roumael*,' 'the caps of the sands.'



CHOUCHA, PLAIN OF AURES.

The general character of the bazinas is that of three concentric or ellipsoidal inclosures of stones, of greater or less dimensions; so

arranged as to form a series of steps. Sometimes, indeed, there are but two outer circles, and occasionally only one. The diameter or longest axis of this figure is about thirty feet; in the centre are usually found three long and slender upright stones, forming three sides of a long rectangle, and the interior is paved with pebbles or broken stones.

Near these bazinas are often found square or rectangular inclosures of large stones, arranged in single lines, and without steps, the interior being also paved in the same manner as the bazinas.

Occasionally also, at one of the angles of the inclosure, upright stones are found, on which are sculptured one or more circular holes or cups, closely resembling those so often found on Megalithic monuments in Scotland.



SCULPTURED STONES, CROMLECH, ALGERIA.

The bazinas are not usually found associated with other forms, but, as has already been noticed, a dolmen is in one instance found placed on a bazina; so also instances do occur in the Hodna, of bazinas being built upon chouchas; and in this way, and to this extent, these various forms are brought into relation with each other.



BAZINA WITH CHOUCHA: THE HODNA.

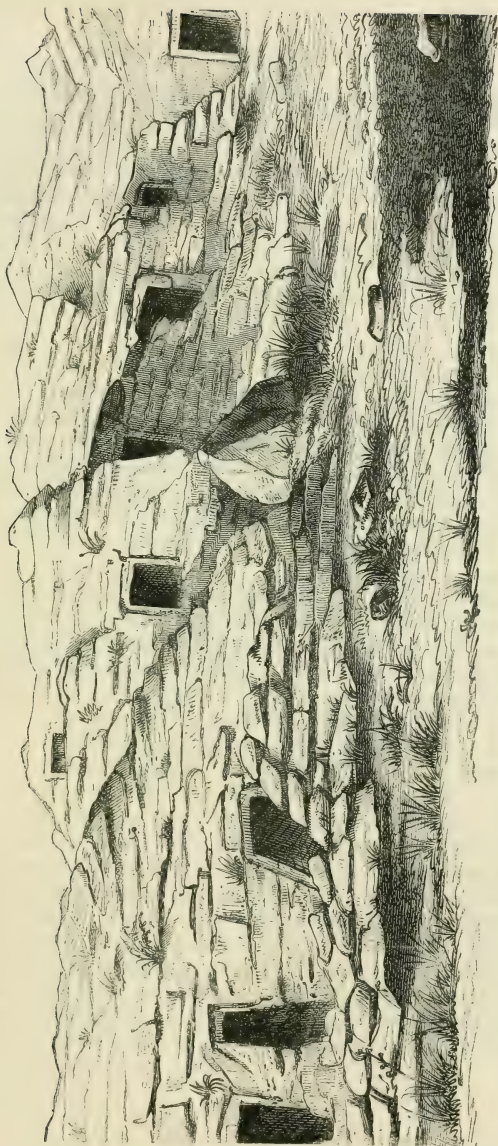
It is a most significant circumstance with reference to the history of these bazinas, that M. Letourneux has recognised,

at the foot of the Aurés, and with the Ouled-Abdi, amongst the stones with which they were constructed, hewn stones, and even columnar shafts, of Roman workmanship.

The chouchas are found in the neighbourhood of the bazinas, and closely associated with them. They consist of courses of stone regularly built up after the fashion of a circular wall, and not, like the bazinas, of steps. The diameter varies from about seven feet to as much as forty feet, and the height of the highest above the soil does not exceed five or six to ten feet. They are usually capped or covered by a large flagstone, about four inches thick, and underneath this is a rectangular trough or pit formed by flat stones, three feet to a foot and a half in thickness. The interior of these little towers is paved in the same fashion as the bazinas; and indeed M. Payen considers that they are the equivalents, on the mountains, of the bazinas of the plains; the only difference being that, on the mountains, the stones are arranged as an upright wall, and in the plains they are formed into steps.

The tombs which next deserve notice were, I believe, first described by M. Letourneux. They are called in Arabic, 'haouanet,' shops, from the resemblance they bear to the little shops or stalls of the bazaars. They are sepulchres hewn in the rock, and opening from the face or side. The openings are square, oblong, or trapèze, and are notched, showing that originally they were closed by a door or shutter of wood or stone. Some large discs are found sculptured in the interior. They contain human bones; but no inscription or sculpture has hitherto been noticed, nor any pottery, or metal, or stone implements or ornaments. These rock tombs, which resemble those found in Cyrene, described in Messrs. Porcher and Smith's work, occur at Gastal and at Roknia, and in the neighbourhood of dolmens and cromlechs. On the Tunisian frontier some of them occur, into which the opening is made from the surface, instead of from the side, of the rock.

M. Letourneux has also observed near Zymelah some sarcophagi cut in the surface of the smooth flat rock. These present two uniform cavities, formerly covered with flagstones. Both terminate in a sheath-like fashion. In the



ROCK TOMBS (HAOUANET), GASTAL.

larger, the place for the shoulders is square, and in the smaller, round; possibly they were intended for husband and wife.

All the monuments hitherto described are found in the provinces of Algiers or Constantine, but the province of Oran, as well as Tunis and Morocco, are said to be quite as rich in these remains. Dolmens, like those of El-Kalaa, have been seen by Mr. Macarthy at Zeldou, near the ancient Arab city of Tlemcen, and a most extraordinary megalithic tomb has also been described by M. le Commandant Bernard, as existing at Tiaret in the same province. According to his account the capstone, in our measurement, would be about sixty-five feet long, twenty-six broad, and nine feet six inches thick; and this enormous mass is placed upon other rocks, which raise it between thirty and forty feet above the surface. Three troughs, each about twelve feet square, are cut on the upper surface of the capstone, and are connected with each other by channels of four inches in breadth. In order to enable visitors to ascend, foot-holes are cut in the upright stones.

These, then, are the principal prehistoric sepulchres that up to the present time have been noticed in Algeria; some others however have been discovered, which appear to deserve a passing notice. Thus M. Letourneux has observed, on the plain of the Cheffia, on the road from Bona to Bou-hadgar, a group of cromlechs, and on the largest stone of one of these is an inscription in Kabyle or Berber characters. These Kabyles are generally regarded as the '*indigenes*'—the Libyans of Herodotus—Numidians of Sallust and Polybius. They were probably converted or compelled to Islamism by their Arab conquerors, and they now constitute a numerous and industrious race, entirely distinct from the Moors and Arabs. They inhabit the mountainous country south-east of Algiers, of which the principal ridge, the Jujurra, was known to the Romans as the Mons Ferratus. Although these people have a language of their own, perfectly distinct from the Arabic, they have now no alphabet: that which they once had has been lost for ages; and thus their words, when written, are written in Arabic characters, and the few Berber

inscriptions which remain are as unintelligible to them as to us. Some of the characters on the stone appear to resemble the Greek. In his second memoir M. Feraud speaks of a dolmen on the road between Tarf and Bona, the capstone of which is also inscribed; probably this is of the same date as the cromlechs seen by M. Letourneux.



CROMLECH WITH INSCRIBED UPRIGHT STONE, NEAR BONA.

Another interesting monument which M. Letourneux has examined is in the form of a Roman cippus. It bears the figure of a man holding either a bunch of grapes or a fir-cone, with a crescent carved on a panel above his head. This also bears a Berber inscription, some of the letters of which resemble those on the cromlech-stone.

In some places single upright stones are found, bearing inscriptions in characters identical with those to this day

employed by the Touaregs, the points being replaced by parallel horizontal lines.

Various as are the Algerian tombs in shape and structure, the contents of all, so far as they have been examined (and that examination indeed has necessarily been but very im-



MONUMENTAL STONE,
PLAIN OF THE CHEFFIA.



INSCRIBED STONE, CHEFFIA.

perfect), appear to be of nearly the same kind. Occasionally, and principally in the smaller dolmens, the bones of several skeletons are found in a confused mass; but in the larger tombs it is usual to find but one skeleton. These single skeletons, when in a sufficiently good state of preservation to allow of examination, are almost always found in a doubled-up posture, the knees brought up to the chin, and the arms crossed over the breast. Sometimes they are placed in a sitting posture, but more frequently recumbent on the

left side, and occasionally with a stone for a pillow, with the head turned to the north, and in this respect resembling several of the dolmens lately discovered in Anglesea, and described in the '*Archæologia Cambrensis*' for July, 1868. At first sight it might seem that this method had been adopted in order to avoid the labour and expense of forming a larger grave; but this was clearly not the motive, since we find that the same method is followed when the grave is sufficiently long to allow of the skeleton being placed at full length; and we know also from a passage in Herodotus, to which I shall have occasion to refer, that the people who in all probability formed these tombs were especially careful that their friends should die in a sitting posture, and should be buried as they died.

The crania appear to be of an ovoid form, and would lead to the belief that the people were of the Caucasian race. General Faidherbe's work contains a very full account of those found at Roknia, together with accurate figures and measurements. In no single instance that I am aware of have any traces been found of the practice of cremation.

The objects hitherto observed in these tombs are as follows:—In one of the dolmens near Batna two human skulls, without any other bones, were found, placed at the feet of the skeleton which occupied the grave; and in some others the same usage had evidently been followed. The bones of horses had also been found in several instances; and in almost every interment, two, or three, or perhaps four bowls or cups were found, usually at the corners of the sepulchral chamber, and near to the head. General Faidherbe thinks it probable that one of these vessels was placed with each body, and that thus there are usually as many bowls as skulls in each grave. These bowls are of clay, very rude, and badly baked; they contained no bones or ashes, and were evidently intended for domestic use. They are usually about three inches high, and four inches in diameter, and closely resemble, as well in form as in material, those lately found in the bone caves at Gibraltar, and indeed those also which are still in use at Ceuta.

In several of the dolmens, some objects of metal have been

discovered, usually in bronze. These consist of slender bracelets, with little or no ornament, plain fibulæ, and rings of thin wire. Very rarely small objects in both copper and iron have been discovered, and in a tomb near Batna, M. Feraud and Mr. Christy found a small ring with an ornament resembling a quatrefoil on the bezil, and, at the same time, a coin of the Empress Faustina.

In the dolmens of Guyotville have been found implements in jade and limestone and arrow-heads in flint, and near Constantine a wedge or '*hache*' made from the stone of the country. In the tumulus on the plateau of Sersou, which M. Bourguignat considers symbolic, he found some flint implements perfectly well cut, of an elongated form, with one of the sides flat, produced by a single blow, and the two other sides bevelled, shewing many planes and facets; and in another tumulus, which he thinks was designed to represent a scorpion, he found similar flint implements, and also a '*hache*' of sandstone polished, five inches long by three wide, and one and a half thick.

One of the most singular phenomena presented in some of these tombs is the presence of a number of land-shells. General Faidherbe informs me that he always found at Roknia a great number of snail-shells, and that the urns or pots were entirely filled with them. M. Bourguignat reports that near Teniet-el-had, in the only dolmen which he was able to examine, and which was a covered one, he found a great number of shells, chiefly *Helices* and *Ferrussacia*; and that while some of these were recent species, others had become extinct. M. Feraud also notices the presence in almost all the dolmens which he examined of a great number of land-shells, viz. *Bulimus truncatus*, *Helix aspersa*, *Helix cirta*, and *Helix massiliensis*. The same circumstance has been observed in connection with English barrows. Turton, in his work on 'British Land and Freshwater Shells,' says that the achatina is frequently found in Celtic barrows; and I learn from Mr. Cunningham that, on opening a barrow on Roundway Down, Wilts, in 1855, many shells of *Helix nemoralis* were found, mixed with ashes and the bones of birds and other small animals. They were also found abun-

dantly in a barrow at Baydon in 1859, and in the Wiltshire barrows this shell and the *Helix aspersa* also are constantly found, although these snails do not live on the downs on which the barrows occur.

It is difficult to account for the presence of these shells. At first sight it might seem that they were intended as food, or as symbols of food, for the deceased, especially as they are found in the earthen cups or bowls. But some of them are so small that they never could have been used for food, and the practice would seem rather to have had its origin in some strange superstition. In many countries a superstitious regard is still entertained for some land-shells. In India, the achatina was looked upon with such reverence that its exportation was forbidden on pain of death; and the negroes of Prince's Island place strings of snail-shells above their doors, as a *fetiché* or offering to their gods.

It might be surmised that these shells had found their way into the Algerian tombs for the purpose of hybernation; and it is true that snails do hybernate in that country; but the climate is so warm, even in winter, that they may perfectly well lie torpid without burying themselves in the earth; and besides, since in dolmens near the coast marine shells are often found in large quantities, we may reasonably conclude that, from similar motives, land-shells were deposited in inland places.

The Arabs have various traditions as to the origin of these monuments; but the only one which seems worthy of attention is that which ascribes them to the people who lived before, and until the Saracen invasion, and the consequent conversion of the vanquished race from Paganism. Thus they say that they were built by the Djouhala—the ignorant or heathen people—and this belief is consistent with the name, Isnam—the idols—frequently given to the tombs. In other instances, however, they follow the usage of all rude and uncultivated races in ascribing the origin of these structures, either to some foreign people (as though they did not desire that their own ancestors should have the credit of them), or else to some beings gifted with superhuman power — ‘*omne ignotum pro magnifico.*’ Thus the

stupendous mausoleum near Kolea, which Pomponius Mela describes as having been built by the second Juba, king of Mauretania, to be the '*Monumentum commune Regie gentis*,' is now known to the Arabs only as the '*Koubber-el-Romeah*,'—the tomb of the Christian woman. And as regards the more ancient dolmens and cromlechs, they are attributed in the popular belief to 'El-R'oul'—the ghouls, 'El-R'oulat'—vampires, 'D'jinn'—the genie; just as in our more northern latitudes similar monuments are believed by many of the common people to be the work of giants or elves or fairies: the popular archæology is almost always mythological.

The Algerian sepulchres appear to differ from those usually found in Europe in the following particulars, viz. their immense numbers—the entire absence of any traces of cremation—and the different character of pottery—there being no instance of those elaborate bone and string markings which are so often seen in British cinerary urns. The barrows so frequently met with in Great Britain seem to be quite unknown in Africa, and so also are the chambered and cruciform dolmens of Brittany; while, on the other hand, the chouchas and bazinas, and the rock-tombs, are forms entirely unknown in Great Britain, and so also are the paved cromlechs and the cromlechs formed of concentric circles, as well as those with inscribed stones. Probably the paving was adopted in order to preserve the grave from violation by hyenas and jackals, so abundant in this country.

But while there are so many points of difference, there are also several remarkable correspondences. The covered and uncovered dolmens bear an extremely close resemblance to those as well of Great Britain as of France; the contents also are pretty much the same, except that bronze seems to have been a little more frequently met with in Algeria; and this indeed might be expected, since long before our era they had abundant opportunities of procuring it. Examples of dolmens placed immediately within the cromlech, instead of in the centre, are met with at Trewavas in Cornwall, at Ballindalloch, Banffshire, and elsewhere in Great Britain; the cup-sculptures are about identical with some of those recently described by Sir James Simpson; and drinking-cups

are frequently found placed near the skulls of skeletons throughout England and Wales.

Many instances occur in Europe of the placing of mollusks in dolmens. Usually these are of marine species, but Mr. J. W. Lukis informs me that in a dolmen in the island of Herm he discovered an immense quantity of snail-shells. The burial of horses—probably those of the deceased—in the same tomb seems to have been common throughout Europe in the prehistoric period, and indeed much later; and so with regard to the placing of the corpse in a doubled-up (*repliée*) posture. M. Troyon, in an able paper published in the '*Revue archéologique*,' affirms that this mode has been in use in Europe from the earliest times, and he cites numerous examples of the same method from Peru, the Andaman Islands, New Caledonia, Babylon, the plains of Troy, the Chersonesus, North and South America, Brazil, and several other countries. He considers that this attitude was symbolical, and that it was adopted spontaneously, and by common consent of all races of mankind, from its resemblance to that of the *fœtus* in its mother's womb, to intimate that the buried man was again a child, reposing in the bosom of the universal mother, earth, awaiting a new birth.

There is one point of resemblance between some of these tombs and some of those in Europe which appears to deserve particular notice, viz. the presence in the grave of a quantity of earth of a much lighter and finer description than the surrounding soil. M. Payen speaks of it as '*poussière légère*,' and he says that it was found in almost all the circular tombs (*chouchas*), and that those which did not contain it were empty. In the dolmen in which the two detached skulls were found by Mr. Christy, a well-preserved skeleton was found lying in a bed of very fine earth. M. Letourneux informs me that he also has observed the same circumstance in the dolmens which he examined. Similar deposits have repeatedly been noticed in England and France, in Portugal and in Italy. The Rev. W. C. Lukis found a bronze cinerary vase at '*Les Roches Plongsumden*' filled with fine earth. At Tumiach, the skeleton was placed in a bed of detritus resembling sawdust. M. Pereira-da-

Costa found a quantity of fine earth with animal matter, in the Anta de Melrico in Portugal. I have myself found a similar deposit covering the skeleton in an Etruscan tomb at Capua; and Signor Castellani of Naples assures me that he has almost always noticed it in the Etruscan tombs which he has explored; he says that it appears as if it had been passed through a fine sieve.

Why this should have been done we know not. Possibly it was repugnant to the survivors that the remains of their buried friends should immediately mix with common earth, and become, as Shakespeare calls it, 'a kneaded clod;' and so this finer earth was used as a kind of substitute for embalmment.

Now the ancients, as is well known, when speaking affectionately of their dead, were wont to express a wish that the earth might lie lightly upon them. 'Sit terra levis' seems to have been the usual formula. In the '*Alcestis*' of Euripides, when the Queen has just expired in order that her husband may live, the chorus introduce their pathetic lament by the exclamation 'Light may the earth fall upon thee, lady;' and in a passage in the '*Helena*' Menelaus says, 'The gods are just, and when a brave man falls before his foes, light in his tomb will lay the earth.' They seem first to have symbolised the favour of the gods towards the deceased under the figure of 'light earth,' and they embodied or realised their symbol by placing fine or sifted earth in the tomb. May it not be that our own custom of strewing a little earth upon the coffin before the vault is closed, is derived remotely from this usage.

Upon the whole, having regard to the very close resemblances between these sepulchres and those of Europe—resemblances which cannot be looked upon as casual—it seems not improbable that they may have been the work of people having had one common origin, for it is to be observed that the correspondence exists not alone in things of essential importance, matters which must almost of necessity be incident to *every burial*, but in details, trifling indeed in appearance, but of great value as constituting a chain of circumstantial evidence. The dead could have been perfectly

well buried without the accompaniment of drinking-cups,—without snail-shells,—without sifted mould, or the skeletons of horses; they could as well have been placed on the right side as on the left, in a recumbent as well as in a sitting or crouching position; and their tombs would have been just as effective without sculptured cups as with them. Why then were these usages adopted in countries so wide apart, but by reason of some connection or relationship between the people who inhabited them?

Several archæologists, as well in France as in Algeria, have from time to time occupied themselves with speculations and discussions as to the races to which the construction of these monuments should be ascribed, and particularly as to how far they can be regarded as of Phœnician origin. The subject is one of great interest and importance, but with our present imperfect knowledge of these remains it seems impossible, or at least imprudent, to go beyond mere conjecture.

The question of origin is intimately, or indeed inseparably, connected with that of age; and, as to this, we are not without some *indicia* which seem hardly to have been sufficiently noticed, but from which it may perhaps be reasonably concluded that these monuments are of a much later date than has been hitherto supposed; that, in fact, they immediately preceded, and to some extent overlapped or intruded into, the historic period; and, if that be so, is it not reasonable to conclude that the dolmens and cromlechs of Great Britain and France and Germany, which, as we have seen, so closely resemble these in many minute particulars, are also of much later date than is often, indeed usually, supposed? M. Bourguignat, indeed, in his paper on the symbolic monuments of Algeria, which he says are of the polished stone epoch, expresses his belief that that epoch is to be regarded as extending from the year 8000 to the year 4000 before the Christian era, and he adds that he shall be able to establish this.

It has been noticed that the skeletons are almost invariably found in a sitting or doubled-up posture, the knees drawn up to the chin, and it is also known that although

the tombs are found in such prodigious numbers, no traces are found of any cities or villages in which we can suppose that these people dwelt. Roman remains indeed are found in abundance, but clearly the tombs are not of Roman workmanship.

We find, however, a passage in Herodotus which may perhaps throw some light on the subject. In the book 'Melpomene,' section 190, when describing the various Nomade tribes of Africa, he says, 'These Libyan nomades observe the same ceremonies with the Greeks in the interment of the dead. *We must except the Nasomones*, who bury their deceased in a sitting attitude, and are particularly careful, as any one approaches his end, to prevent his expiring in a reclined posture. Their dwellings are easily moveable, and are formed of the asphodel shrub secured with rushes. Such are the manners of these people.'

It is also evident from another passage, that the people whom he here describes were accustomed to erect tombs and monuments for their deceased friends. In section 172 he says, 'Their mode of divination and of taking an oath is this:—They place their hands on the tombs of those who have been most eminent for their integrity and virtue, and swear by their names. When they exercise divination, they approach the monuments of their ancestors, and there, having said their prayers, they compose themselves to sleep. They regulate their subsequent conduct by such visions as they may then have.'

The people thus described seem to have occupied the regency of Tripoli, seven or eight degrees east of Constantine; but they were undoubtedly a nomade, and a warlike race, frequently making fresh conquests and migrations, and their practice of inhumation might thus be readily introduced into the neighbouring regions. The account given of their customs by Herodotus (and which he expressly says were *peculiar* to them), exactly applies to the province of Constantine, both as regards the former condition of the people and the present condition of their tombs. The plains still bloom with the asphodel which they gathered for their frail huts; and although the huts have passed

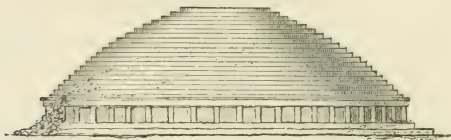
away, the tombs which remain are probably those on which they were accustomed to invoke the names of their heroes and saints; and in them the skeletons also remain in their sitting or crouching postures to attest, in this respect, the accuracy of the historian.

Now Herodotus lived about 450 years before the Christian era, and 300 years before the Roman conquest of Algeria; and we may well believe that during those periods, and for long after the Roman occupation, the natives still practised their ancient modes of sepulture; for, however great may be the tyranny which a subject race has to endure from its conquerors, their funeral customs are seldom interfered with. But although the aborigines may have continued after their subjection to bury their dead after their own fashion, they could not fail to obtain occasionally from their invaders some few personal ornaments, and thus we may account for the presence of bronze bracelets and ear-rings and fibulæ of trifling value, just as it will happen in future years that beads of Birmingham manufacture will be found in the graves of Negroes and North American Indians.

But there are other reasons for assigning a comparatively recent date to most, if not all, of these tombs. The discovery by M. Feraud of a single coin of Faustina, if it stood alone, would not pass for much; but since M. Letourneux has found in the bazinas undoubted fragments of Roman sculpture, and since there are obviously many reasons for believing that the dolmens are no older than the bazinas and chouchas, we may well conclude that many of the monuments in question were coeval with, if not later than, the Roman occupation; and this indeed accords with the traditions of the Arabs, who, as we have seen, consider them as the work of heathens—*Djouhala*. They look upon them with superstitious dread, and call them '*Esnam*'—the idols. It seems highly probable that, on their conversion to Mahommedanism, they should renounce a mode of sepulture at variance with the precepts of their new faith.

It is also worthy of notice on this head, that the stupendous tomb between Constantine and Batna, known as the Medracen, which was the place of sepulture of Syphax

and the Numidian kings, and thus comes far within the historical period, is in fact only a representation, on a large scale, of the bazina and the choucha combined.



MEDRACEN, TOMB OF SPHAX.

I am not aware that M. Bourguignat has yet adduced any reasons for ascribing so great an antiquity to these remains other than that alluded to in his first work, viz. the presence of extinct species of land-shells. He has, however, given the name of but one such shell—*Helix Vatoniana*; but even if this were well defined, it might readily have found its way into the tomb with the earth with which it was filled; and since we have been hitherto unable to detect a single shell of extinct species in the much older drift gravel, we are entitled to require more conclusive evidence than has been yet given of their presence in tombs of the neolithic age.

The PRESIDENT said the megalithic remains to which their attention had been called were very interesting, because they exhibited a certain stage of improvement, one stone having an inscription upon it. We did not find in Europe any monuments of the kind showing the progress in civilisation which these exhibited. If the monuments that we possessed, such as those at Stonehenge, were produced by any of the races that possessed any civilisation, he thought it would have been manifested in their shape and character, as in the case of these in Algeria. Here was a link connecting the rearers of these stones with civilisation; but in England we had nothing of the kind, and therefore he thought those who raised the stones in this country had no connection with civilised races.

Mr. BUSK observed that the caverns described by Mr.

Flower in Algeria presented, in their contents, &c., many characters precisely similar to those of the rock caverns in Gibraltar, described by him on the previous day.

In reference to a remark from Mr. O'Callaghan, Mr. E. T. STEVENS said that the letters LV and the sickle-like figure, upon what was the impost of the central trilithon at Stonehenge, were cut at a very recent date. Mr. Zillwood of Amesbury saw these marks about 1819, soon after they were cut. He looked upon them at the time as having been done by some idle and mischievous visitor, and took no special notice of the circumstance. Great was his astonishment in 1864 at hearing that some persons regarded these figures as ancient. After the lapse of nearly half a century it was difficult for him to trace out the facts, but he found two persons whose evidence fully support his own account of the matter. One of these, John Pike, has been under-shepherd on the farm on which Stonehenge stands from his boyhood, and was at the stones almost daily. He remembers seeing two men leave Stonehenge, and when he reached the stones he found the marks freshly cut. He is positive that they were not there the previous day. Joseph Spalding saw the men cutting the marks. Like Mr. Zillwood, Pike could not in 1864 speak positively as to the year in which this took place, but it must have been between 1819 and 1821.

ON THE VARIOUS FORMS OF MONUMENTS, COMMONLY CALLED DOLMENS, IN BRITTANY, POINTING OUT A PROGRESS IN THEIR ARCHITECTURAL CONSTRUCTION, WITH AN ATTEMPT TO REDUCE THEM TO CHRONOLOGICAL ORDER.

BY THE REV. W. C. LUKIS, M.A., F.S.A.

I INCLUDE in the word dolmen all megalithic chambers, whether inclosed in mounds or deprived of their primitive coverings. And in treating of Breton monuments, I insist on their *tumular* character, as a principle of universal application. I know and admit of no so-called dolmen which does not or should not come under this rule. This megalithic structure is a tomb in every stage of dilapidation. It may be found totally enveloped, or partially exposed, or wholly denuded, and in every intermediate state in which may be detected the vestiges of the original tumulus. Instances of complete denudation are comparatively rare.

These buildings are erected on hill tops, on hill slopes, on river banks, on plains, in valleys, along the coast line, on promontories, and on islands. They occur occasionally in clusters. I have seen on a slight elevation in the parish of Erdeven, Morbihan, as many as four, the bases of whose enveloping mounds must have been nearly in contact; and adjacent to them, on the same elevation, is an unexplored long barrow, which probably incloses another. They are met with in round and in long barrows, mostly singly; but the same mound not unfrequently incloses two and three distinct chambers, with a long passage attached to each. They are not confined to lands bordering the sea, although they exist there at the present day in large numbers, but are scattered over the interior of the province where many causes have contributed to reduce their number.

Their forms are very varied, much more so than is generally supposed; and these forms indicate not merely a long residence of their builders in this country, but, as I believe, a progress in constructive science.

The simplest form of chamber that we should expect to find, would be that usually denominated a *kistvaen*, or small sepulchral stone chest, either rectangular, or approaching to a polygonal form, in consequence of the rude and misshapen character of the materials employed, roofed with a rough block of nature's hewing.

This we should suppose would be the first and earliest kind of megalithic tomb from its simplicity, and possibly it was; but it is worthy of remark that few, if any, such buildings exist in Brittany that seem to belong to the earliest period. It may be that they were very soon found to be inadequate for the requirements of families, and inconvenient for the development of ritual observances connected with the burial of the dead, and were remodelled, altered, and enlarged to meet these wants. Some of those that remain belong manifestly to a comparatively late period. These may be recognised by the mode of construction as well as by their contents, *e.g.* the small chamber, with its artificially squared walling stones, of the round tumulus in the forest of Carnoët, Finistère, which was explored in 1843, and is said to have contained gold and silver chains, silver-plated bronze daggers, and flint arrow points; the small sepulchral chamber of the long barrow of Mané-er-Hrouich, Lochmariaker, constructed with a dry walling of stones of various dimensions (none of large size) laid horizontally, which contained stone weapons and ornaments composed of materials of supposed Eastern origin; that of Kerlivit, near Douarnenez, Finistère, a chamber of very regular construction, which is said to have contained bronze weapons, &c., are evidently of later date than those which are irregularly built with rude massive unhewn blocks of stone, where the weapons and ornaments correspond with the structures in simplicity of character, and are manufactured of materials indigenous to the country.

The common form which meets us on every side is the chamber with its covered way or passage, which passage

becomes a characteristic feature, and acts an important part in many instances, being often the gallery of communication with one or several side chambers, in addition to the principal one.

Taking this form, then, for a basis, the two accompanying groups will exhibit the striking varieties of ground-plans observable in Brittany. But besides these variations, there is a remarkable difference in the construction of the roofs, which would seem to separate the one group from the other. The first group contains those monuments which are covered with huge flat slabs more or less massive, and the second those which are roofed with overlapping slabs of moderate dimensions, forming a rude kind of vault of bee-hive form. The one I call ceiled sepulchres; the other vaulted sepulchres. The former I consider to be chronologically anterior to the latter; but I do not assert that the position of each monument in the two series is strictly correct. It must be understood that I have met with several examples of almost all these varieties, and that a few of them are local forms: *e.g.* of No. 11 there are several examples in one district of the Morbihan; and No. 13 is frequent in the west of the department of the Loire Inférieure. Those of the first group are more generally distributed.

It is not improbable that several of these forms have been suggested by others which have preceded them. No. 5 may have been easily formed after the model of No. 4, by making the entire structure more rectangular, or by converting the chamber and passage of No. 4 into a long rectangular chamber, and providing an entrance at the side; and No. 11 appears to be an adaptation of No. 3. The complicated monuments Nos. 6 and 7 are not, I imagine, as originally designed. The side chambers appear to be additions subsequently made to an older sepulchre, composed of a chamber and passage; and there are many remarkable examples in Brittany of alterations, enlargements, and additions to the first building. On the other hand, No. 13 is as originally planned, (considerations in support of this statement I omit here for brevity's sake,) proving that the side chamber had become at this period an important feature.

It is not to be supposed that the employment of small stones for a dry walling supporting the roof and a new plan of construction were forced upon the builders by a dearth of materials of colossal size, for these buildings are found in districts where monuments composed of massive stones also exist, and occasionally in the same mound with them; and I have satisfactory evidence to show that where these two modes of building are existing in the same mound, the more massive structure is anterior to the other.

I must admit that I have not found structures like No. 11 in a complete state; *i.e.* with the vault and its enveloping mound. I have found them buried up to the top of the supports, with a slope of ground to a well-defined base, indicating the tumulus, and observed vestiges of the original vaulting, which leave no doubt in my own mind as to its mode of construction. In the case of No. 12, the bee-hive vaulting of two of the side cists remains intact. There are in Great Britain structures analogous to most of these forms; but I am acquainted with two only, which approximate to No. 12, one formerly in the island of Jersey, removed to ornament a park at Caversham near Reading; the other in the Isle of Man.

The cruciform plans remind us of Irish structures, of Weland's Smithy in Berkshire, and of Stoney Littleton, near Bath.

There is another indication of progress, besides that exhibited in the roof, *viz.* a gradual change in the construction of the side walls. The builders wanted head-room, and they obtained it without being dependent upon large blocks for supports. Small stones were inserted in courses between the supports and the covering stones. This was the first method employed. Next, they used a dry walling of small stones, on which they rested their roofing blocks; or they faced this dry walling with slabs, which served for buttresses. As an English example of this last method, I may refer to that of Stoney Littleton, near Bath.

The proportions of these structures I have indicated on the ground-plans.

Taking 100 monuments in Brittany, I have ascertained

their orientation to be as follows (magnetic meridian): NE. 1 instance; ENE. 1; E. by N. 1; E. 8; E. by S. 3; ESE. 7; SE. by E. 4; SE. by E. 34; SE. by S. 1; SSE. 14; S. by E. 3; S. 14; S. by W. 1; SSW. 4; SW. by S. 1; SW. 1; SW. by W. 1; WSW. 1.

The foregoing remarks are made with the view of drawing the attention of archæologists to the construction of megalithic monuments, from which I think much information relating to the degree of civilisation attained by their builders may be derived. They are offered to this meeting more as suggestions than otherwise. It seems to me, from all I have seen of these ancient buildings, that by pursuing their study in this way, by carefully planning and making sections of them, and by comparing them with the plans of monuments in other countries, that their chronological order, and the progress in constructive science to which I have alluded, may be established.

M. LOUIS LARTET then read the following communication from M. REBOUX of Paris, which was accompanied by the exhibition of various flint implements from the Paris beds:—

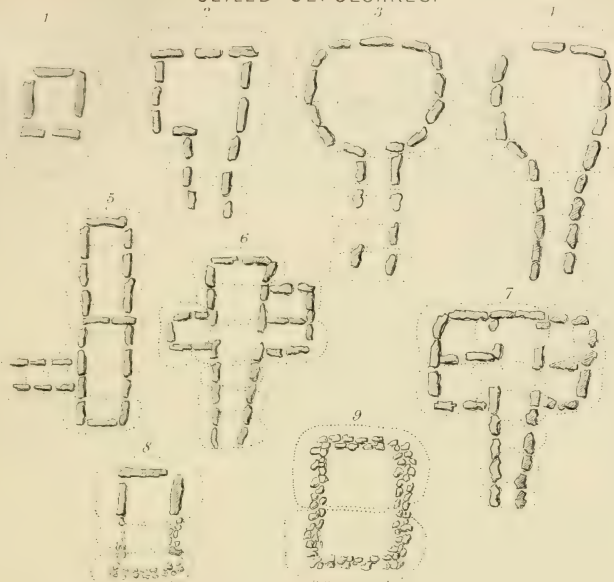
‘ Les grands travaux de Paris n’ont pas eu pour seul résultat l’embellissement de la capitale; ils ont encore procuré à la science des découvertes inespérées.

‘ En 1859, tandis que je cherchais des fers cristallisés et sulfurés dans différentes fouilles et carrières de Paris, j’ai trouvé une molaire de l’*Elephas primigenius* à Le Vallois, carrière d’Hénain, route de la Révolte, à 9 mètres de profondeur. A cette époque je quittai Paris, mais dès mon retour je m’empressai de retourner voir les carrières. J’appris sur ces entrefaites que l’on trouvait dans les terrains quaternaires de Picardie des instruments en pierre travaillés de main d’homme mêlés aux ossements de grands mammifères éteints.

‘ Dès 1861 j’avais déjà réuni au moins trente de ces instruments et beaucoup d’ossements et de dents assez mal conservés, pourtant je reconnus parmi les dents celles de bœuf et de cheval.

‘ Je portai le reste à un éminent paléontologiste, dont les

CEILED SEPULCHRES.



VAULTED SEPULCHRES.

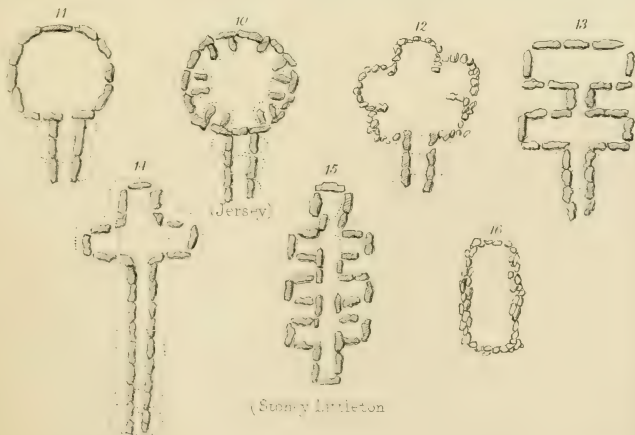




Fig. 2.

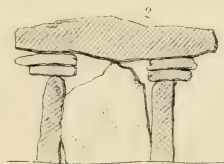
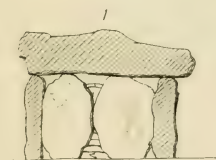
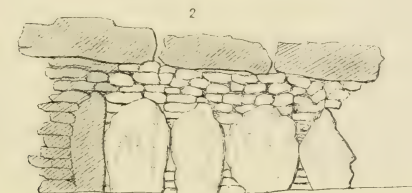
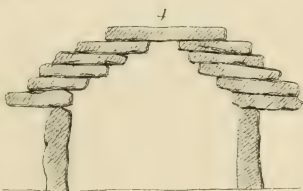


Fig. 12.



conseils m'ont beaucoup encouragé. De 1862 à 1864 j'avais déjà une très-grande quantité de silex, de dents et d'ossements. Voulant faire constater les objets en place et déterminer les conditions de leur gisement, je conduisis différents savants dans les carrières. A cette époque on y avait déjà trouvé une hache en pierre polie; quelques jours après, un ouvrier y recueillit une dent de rhinocéros et une dent d'éléphant, dont je fis l'acquisition après l'avoir toutefois auparavant engagé à les porter au Muséum. Depuis cette époque j'ai visité les carrières tous les jours, et en 1866 j'avais réuni plus de deux mille échantillons. Aujourd'hui j'en possède plus de cinq mille.

‘En étudiant les silex j'ai pu reconnaître trois époques bien distinctes : la *Pierre éclatée*, qui correspond à l'âge de l'ours des cavernes; la *Pierre taillée*, correspondant au grand Préssigny et au niveau supérieur de St.-Acheul; enfin la *Pierre polie*, qui est du même âge que les dolmens. La faune des terrains quaternaires de Paris est très-nombreuse; elle se compose de 24 espèces de mammifères, tous d'espèces aujourd'hui éteintes ou émigrées. Elle se divise ainsi : deux espèces d'éléphants, l'*antiquus* et le *primigenius*; trois espèces de chevaux, l'*Equus pliscidens* (Gaudry), l'*Equus asinus*, l'*Equus caballus*; trois espèces de rhinocéros, le *R. tichorinus*, le *R. Merckii*, le *R. etruscus*; l'*Hippopotamus major*, le grand castor ou trogonthérium; quatre espèces de cerfs, *C. Megaceros*, *C. Canadensis* (Gaudry), *C. Elephas*, *C. Belgrandi*, le daim, le renne. Deux espèces de bœuf, le *Bos primigenius* et l'aurochs, le sanglier, le bouquetin, l'halitérium, l'ours, le grand félis. Je mets sous les yeux du Congrès quelques spécimens de dents et de silex taillés provenant des carrières, avec une carte indiquant où ont été trouvé les ossements humains et les autres objets remarquables.’

ON QUARTZITE IMPLEMENTS OF PALÆOLITHIC TYPES
FROM THE LATERITE FORMATION OF THE EAST COAST
OF SOUTHERN INDIA.

BY R. BRUCE FOOTE, Esq., F.G.S.
(*Of the Geological Survey of India.*)

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ON THE TRIBES.
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PERIOD.
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I. *Introduction. Strong Resemblance of the Quartzite Implements to the Flint Implements of the Drift in Europe.*

THAT the tribe of men which inhabited the eastern coast of Southern India during the period of formation of the deposits now known as the Lateritic deposits should have chipped implements out of quartzite of precisely the same types as those chipped out of flint by the flint-folk, is a fact worthy of the attention of archæologists and ethnologists as proving a strong similarity in the principal circumstances of their life, which in some points were not materially affected by climatic differences. There can be no doubt that in both cases there must at times have been a hard struggle for the maintenance of life, such being the inevitable consequence of an uncivilised state. Both countries were covered with vast forests swarming with wild beasts; and in the case of the Indian forests at certain seasons of the year, generally at the advent of the first

rains during the hot weather, vast tracts of country became, as they still become, in the highest degree prejudicial to human life from the evolution of pestilential malaria. If the men inhabiting Southern India had not the bitter winter-cold to contend against, they had the much greater unhealthiness of the forests, and the much more acute character of many tropical diseases to suffer from, in addition to the greater danger from the more formidable character of the wild beasts, whose boldness and ferocity increase with the defencelessness of their human prey. One terrible scourge to humanity, which in cold climates is hardly known, but which in the tropics demands hundreds and thousands of victims every year, and to which naked savages are especially exposed, is the great abundance of snakes of the most deadly venomous character, inhabitants both of land and sea.

All things considered, it will be evident that the Indian tribes, even if the climatal conditions were much more favourable than those experienced by their contemporaries in North-western Europe, had their full share of hardships to contend against.

Both peoples must from necessity have been hunters, fishermen, and searchers after roots and fruits, and the similarity of their requirements in these pursuits would turn their thoughts in the same direction, namely, to supply themselves, in the first place, with weapons to contend against formidable wild beasts and to hunt for game, and with implements. A second mental effort would lead them to prepare implements such as axes, adzes, hoes, and wedges, wherewith to ameliorate their general condition.

The similarity of training in what Professor Huxley so happily termed 'the school of necessity,' resulted in the production, by these so widely separated tribes, of implements of stone so marvellously alike in shape and size as to compel the belief that the makers must have occupied the same level of intelligence and skill. This resemblance of type between the flint and quartzite implements has not failed to attract the attention of such of our leading archæologists and geologists as have had the opportunity of comparing even a small series of the quartzite specimens with the European

flint implements. Mr. John Evans, Mr. Franks, Sir Charles Lyell, and Mr. Prestwich, have each of them expressed their recognition of this resemblance.

The Indian tribes having no stone at command so homogeneous and fine in texture as flint, chose the most analogous and most suitable material available, which was quartzite, a metamorphosed sandstone, generally of a semi-vitreous character, of which they could obtain an unlimited supply.

The implements manufactured by these people are found in different parts of the Madras Presidency, either imbedded in various formations, or lying loose on the surface, and at very different levels: from a little over sea-level up to an elevation of 1,400 feet. The levels at which implements have been found offer apparently a clue to the circumstances under which they were preserved from withering agencies by being deposited either in sub-aërial, freshwater, or marine formations.

The latter or marine condition, I believe, affected only those implements which are found at levels of less than 600 feet above the present sea level, and it is these only which I propose considering in this paper. For the data and considerations which have led me to this conclusion about the heights at which quartzite weapons are found, I must refer to the paper I had the honour to communicate to the Geological Society in June last.*

II. *Geological Position and Features of the Laterite.*

A short sketch of the geological features of the eastern part of the peninsula is essential to the comprehension of the circumstances under which the quartzite implements are imbedded in the laterite.

From the latitude of Madras northward to the river Kistna, the highlands nearest to the sea, which are the eastern ghâts, consist of metamorphic rocks belonging to two series. The older of these is the great Indian Gneissic system, strongly resembling, in petrological characters, the Laurentian system; the younger is the Kádapá (Cuddapah) system, resting with

* Quarterly Journ. Geol. Soc. vol. xxiv. Nov. 1868.

marked unconformity on the older, and very strongly resembling the Cambrian system.

The belt of land (sloping gradually towards the coast), which lies along the foot of the Eastern Gháts, is in part occupied by Gneissic rocks (the once superincumbent Kádapá rocks having been removed by denudation), and in part by younger sedimentary rocks, the oldest of which belong to the Jurassic period. Resting on these we have the laterite formations, which in their turn disappear to the eastward under recent fluvio-marine coast alluvium.*

Each of these younger series was deposited, as a fringing coast formation, against the highlands of their respective periods.

Laterite, as defined by Dr. Buchanan, the first geologist who described that characteristically Indian formation, is a more or less ferruginous clay, generally traversed by numerous vermicular channels, which are often filled with lithomarge, or with clayey sand, but often also found quite empty, giving the rock a sponge-like aspect. When exposed to atmospheric action this clay becomes, as a rule, highly indurated and coated with a glaze of impure brown hæmatite. For the laterite in this condition I propose using the term 'laterite-rock,' to distinguish it from the more gravelly and sandy conditions which it frequently graduates into.

The laterite-rock rarely contains foreign substances, but in some places it assumes a conglomeratic character, as for example in the north-western part of the Madras district, and then it includes water-worn masses and pebbles of quartzite, with a few of gneiss and vein quartz.

The number of pebbles frequently becomes very great and the clayey matrix is almost or indeed entirely replaced by sand, with an admixture only of ferruginous matter in the form of pellets of clayey brown hæmatite. More rarely the clay passes into pure ferruginous sand.

Implements have been found both in the conglomeratic and gravelly beds.

* The Cretaceous system does not appear to be represented in the Madras district, northward of the Palar river, although developed to a considerable extent further to the south in the South Arcot and Trichinopoly districts.

Viewed as a whole the position occupied by the laterite deposits of the east coast is that of a terrace-like fringe running parallel to the coast and skirting the base of the highlands. This terrace, which has everywhere a considerable slope to seaward,* has been cut through in many places by the existing rivers, and formed into a series of low plateaux capping the watersheds between the rivers in the lower parts of their courses.

Along the inland or western edge of the terrace, this plateau character is almost lost from excessive denudation by sub-aërial agencies. This denudation of the more sandy and gravelly beds has been so complete, that over considerable areas nothing remains to indicate their former presence but a sprinkling of coarse quartzite gravel and the larger ferruginous concretions, which were too heavy to be swept away by mere pluvial action, and have accordingly been left behind on the surface of the older rocks. Among such debris of the gravel beds many implements have been found.

A very remarkable fact in connection with the presence of these works of human skill in the laterite formations, is the non-discovery hitherto of any organic remains which would throw light on the origin of these interesting deposits. Though most carefully searched in numberless localities, especially since the discovery of the implements, nothing whatever has been found but a few scattered fragments of silicified wood derived from the older sedimentary rocks. It remains an unsettled question, therefore, whether the laterite of the eastern coast is entirely, or only in part, of marine origin. From its geographical position, and from a consideration of the conditions which would arise if the land were lowered sufficiently for the coast laterite to be submerged, I believe it to have been of marine origin.

The conclusion which forced itself upon my mind when studying these formations in the N.W. part of the Madras district, and again in the northern part of the Nellore district, was that the laterite deposits were formed during a period of

* This feature in the position of the laterite was also observed in the Orissa laterite, by Mr. W. T. Blanford. See '*Memoirs of Geol. Survey of India*,' vol. i. part iii. p. 280.

elevation, which continued till the level of the land had risen between 500 and 600 feet. The materials of which these beds are formed were partly derived from the numerous islands which must have clustered round the base of the eastern Gháts, and partly brought down by the rivers falling into the Bay of Bengal, and distributed among the islands and along the coast by strong marine currents, corresponding to the great north and south currents, which now sweep up and down the coast during the S.W. and N.E. monsoons, respectively. From the small vertical thickness of the series, and from the coarseness of the conglomeratic and gravelly beds, and the confused manner in which they occur, the deduction appears inevitable, that the series was accumulated in a comparatively short period.

III. *Varieties of Form of the Implements indicative of Varieties of Purpose.*

The quartzite implements found in, or in connection with, these sedimentary deposits, are of various types, corresponding, as has been pointed out already, in size and shape very closely with those found in the drift of England and France. The classification which I adopted in my first account of these weapons, published in the 'Madras Journal of Literature and Science,'* I find still to hold good. The classes distinguished are the following:—

Class I.—Implements with one blunt or truncated end.

- a. Pointed weapons (spear-heads).
- b. Wedge-shaped weapons (axes, hatchets, &c.).

Class II.—Implements with a cutting edge all round.

- a. Implements pointed at one or both ends.
- b. Oval or almond-shaped implements.
- c. Discoidal implements.

Class III.—Flakes.

This classification was based on that adopted by Mr. John Evans, F.R.S., in the first of his admirable papers on 'Flint

* 'On the Occurrence of Stone Implements in Lateritic Formations in various Parts of the Madras and North Arcot District:' Madras Journal of Literature and Science, third series, part ii. October, 1866, see p. 17.

Implements,' addressed to the Society of Antiquaries.* The forms there recognised are—

1. Flint flakes, apparently intended for arrow-heads and knives.
2. Pointed weapons, some probably lance or spear heads.
3. Oval or almond-shaped implements, presenting a cutting edge all round.

Mr. Evans pointed out at the same time that there is 'so much variety among them, that the classes, especially the second and third, may be said to blend or run one into the other.' This is precisely the case with the quartzite implements, for in a large collection of them it would be very easy to find all the intermediate forms necessary to connect the several classes and sub-classes. I have, since the beginning of this year, had the opportunity of seeing several of the best collections of flint implements from the drift, including those of Mr. John Evans, the Blackmore Museum, Mr. Prestwich, Mr. J. W. Flower, and Mr. James Wyatt; and I think I may safely say that I could, from among the hundreds of quartzite implements that I have collected and studied, find a close match for nearly every form in those rich collections. As I have only a few of the Indian specimens left, which I have laid on the table for inspection, I would further call your attention to a set of very carefully executed drawings, prepared to illustrate my original memoir on the quartzite implements.

These drawings represent eighteen specimens, selected not so much for the beauty of their execution, but as illustrative of the classification adopted by me. Exact representations have been taken of one side and one edge in each specimen, the drawings being of the natural size.

The most common forms of these stone weapons are the oval (II. b) and spear-headed (I. a) types, of which I have several illustrations: these, especially the former, have been found in large numbers.

Although a large number of fresh localities yielding implements have been discovered since the publication of the

* 'Flint Implements in the Drift,' by John Evans, F.S.A., F.G.S., 1860, p. 10. From the 'Archæologia,' vol. xxxviii.

memoir above referred to, no form has been found differing sufficiently from the classes already adopted to render it necessary to make a new class. One rather different form of the oval class may be noted, in which a narrow, almost oblong, form has one side almost perfectly flat, the other considerably protuberant near one end; while the opposite end shows a delicately sharp edge. The following sketch gives a sufficient idea of this form, which is far from common. The few implements of this variety which I have seen were of medium or small size, and may have served either as wedges or adzes.

The other varying form, of some interest, is in outline not at all unlike some of the broader forms of flint saws from Denmark; it differs in reality, however, by being very thick, and not showing any positive toothlings. The back being as sharp as the front edge, it is difficult to divine the special use this form may have served for; but too many specimens of it were found to let me think it merely a result of bad workmanship, or the selection of an ill-shaped pebble. All the specimens of this shape were of small size.

The axe, or wedge-shaped, weapon (I. b) was until lately a form unknown in Europe, but Mr. John Evans has now in his collection the cast of an axe, found near Madrid, which is identical in shape with many of the Indian specimens. This is one of the rarest shapes of quartzite implements. One varying form of this class seems to deserve notice, from the very singular shape of the end, which in most specimens terminates either in a thick butt, or else, if trimmed, is nearly semicircular in form. In this example, however, the butt is replaced by a rather sharp point, the sides of which are blunt. The specimen, being unique, was sent to the Survey Museum in Calcutta. The discoidal implements (II. c) are rare forms in India, and



Fig. 1. Fig. 2.



Fig. 3. Fig. 4.

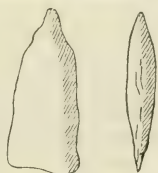


Fig. 5. Fig. 6.

seem to be still rarer, if not quite unknown, from the drift in Europe; at least I have not seen any in the different collections I have looked through, nor is any example of such a form from European sources figured in any book I have had access to.

The nearest approach to this form which I have seen is a specimen in the collection of Mr. J. W. Flower, at Croydon; this, however, has a decided small point, projecting about half an inch from one side.

Of the flakes (Class III.), I have myself seen but very few examples in quartzite that I could accept with any degree of satisfaction, as of unquestionably artificial origin. Mere chips I have always rejected as doubtful, even when showing the bulb of percussion, to which so much importance has been attached by some observers. I have seen examples of such, formed accidentally by the concussion of coarse quartzite shingle, violently propelled by the feet of a herd of terrified cattle rushing across a spread of loose shingle. The few genuine specimens of quartzite flakes were knives and an arrow-head. The former differed from many of the European flake-knives in having only three sides instead of four or more; but this peculiarity may very likely be due to the lesser degree of frangibility (if the term be admissible) of the quartzite as compared with flint: as the blow which would have taken off the dorsal angle of a flint flake would very likely have destroyed a quartzite flake of the same size and shape.

Of arrow-heads I have seen only one that I conceive to be a genuine example: this was figured in my paper published in the 'Madras Journal,' and is now exhibited.

No cores of quartzite from which flakes have been struck off have, to my knowledge, been as yet discovered in the Madras presidency; nor am I acquainted with any quartzite scraper of the typical form, resembling the Esquimaux skin-scrapers.

One chief source, whence the quartzite folk obtained the pebbles they worked, seems to have been in the Madras area, the great Jurassic conglomerates forming the two hill groups now known as the Alicoor and Saltaveden Hills. These conglomerates, which are of great vertical thickness, are made up

mainly of the débris of the great quartzite beds capping and forming the eastern Ghâts.

In the same way as the flint folk of north-west Europe seem to have preferred rolled and water-worn flints, so did the quartzite folk appear to have chosen only water-worn pebbles of quartzite to fashion into their implements, and they appear also to have been to some extent influenced both by the shape and quality of the stone selected. In many cases, one side of an implement shows much more of the original pebble surface than the other, while careful work has rarely been bestowed on a stone having a coarse and lumpy fracture.

No implements have been found in the coast laterite formed of any other material than quartzite.

Of all the localities in the Madras district where the implements are found, none is so interesting, or has proved so rich in examples, as the Atrampakkam Nullah. This locality is doubly interesting, from having been that in which the first chipped quartzite implements were found *in situ* by my friend, Mr. King, of the Geological Survey of India, and myself, in September 1863. This Atrampakkam Nullah is a small tributary of the Corteliar river, falling into the latter six miles north of Trivellore, and thirty miles W.N.W. of Madras. It is a small stream formed by a few land springs, and the surface drainage in wet weather. Its denudatory action on the laterite gravel beds has been greatly enhanced by the debacles resulting from the bursting at three or four intervals of a large irrigation tank, which lies at the head of a wide shallow valley.

The implements here occur imbedded in a bed of lateritic gravel of varying character, the same bed being at some places almost devoid of ferruginous matter, while a few score yards further on it is highly ferruginous, and contains but few included pebbles. This change of mineral character affects the condition of the included implements very much, those occurring in the ferruginous part being as a rule deeply stained, and much weathered; while those from the other parts of the gravel, on the contrary, are but little stained and weathered, but often encrusted in patches with very thin films of carbonate of lime.

A considerable number of implements were found, *in situ*, exposed in the banks of the stream, at depths of from six to ten or eleven feet below the present surface; while the bed of the stream and the very numerous rain-gullies opening into it furnished hundreds of specimens, amongst which were many of the finest obtained from anywhere; while the great majority were well-made specimens.

To account for this immensely numerous collection of implements in a small space is a question much more easily proposed than solved. I cannot on this point agree with the idea my friend, Mr. King, was inclined to hold, that we had hit upon the site of a manufactory of implements. There are, it appears to me, two cogent reasons against it; in the first place, there were no accumulations of flakes or chips, such as must have resulted from the preparation of such a number of implements, many of large size. Secondly, why should there be so many of the most perfect implements left behind.

It can hardly be supposed that they were manufactured so very largely beforehand; that would in itself be opposed to the character of a savage people, one of whose most characteristic features is total improvidence.

An additional objection to the local manufactory idea is offered by the insufficient size of the gravel, which would here yield but few pebbles large enough even for the middle-sized implements. No suitable supply of sufficiently large pebbles could be obtained within a couple of miles, and that only to the west. The hypothesis which has presented itself most strongly to my own mind is, that this part, when still submerged below the sea, may have been a favourite fishing-ground, much resorted to by the quartzite folk on their catamarans or log rafts, from off which their weapons might easily and frequently be washed during sudden squalls. The finding of some perfectly water-worn specimens among a far larger number of perfectly preserved ones may be accounted for by supposing the former had been lost within the surf line, and there been tossed about for a while before being finally imbedded by tidal or current action. The position in which the implement I now exhibit was found imbedded in solid laterite rock, confirms the idea just advanced. The

position of this specimen, which I found at Cummumbaucum, twenty miles N.N.E. of Atrampakkam, was not that usual to bodies deposited under water, namely, lying on either of its sides; on the contrary, it was standing on edge, exactly as if it had fallen through the water, and stuck upright in the mud at the bottom. The rock from which I chiselled out this implement is now typical laterite rock, highly ferruginous, full of vermicular cavities, but very hard and tough, and contains but very few included substances of any kind; it has much less of the characters of a shallow water deposit than even the least gravelly part of the Atrampakkam beds.

At Amerumbardoo, a few miles to the south, I obtained a hatchet-shaped implement from a very clayey variety of laterite. The specimen was imbedded at a depth of upwards of three feet below the surface of the bed, which was overlaid by several feet of sandy soil.

The last locality I shall now allude to where implements were found, *in situ*, in laterite rock, is the extreme northern end of the low laterite plateau lying N.W. of Madras, and locally known as the Red Hills. One of the implements I now exhibit was from that place, and was the first implement found actually *in situ*, in the true laterite rock.

The numerous patches of laterite occurring further northward, in the Nellore district, which are remnants of the once continuous fringing deposit, have yielded a fair number of implements of similar types; but I had not the good fortune to find any imbedded *in situ*.

IV. *Limitation of Distribution of the Quartzite—its probable Influence on the Tribes.*

In a paper which I had the honour to lay before the Geological Society in June last, I have shown that the distribution of quartzite implements is, to some extent, connected with the supply of the raw material whence they were manufactured—the frequency of occurrence of the implements diminishing with the increase of distance from the source of supply.

This limitation of the supply of quartzite, dependent on the geological structure of the country, could not fail to

affect the men of that period, either by compelling them to remain within reach of the material whence they formed their domestic and warlike implements, or by causing them to make periodical migrations to localities whence they could supply themselves, or else by giving rise to a species of trade with the division of the tribe which might possess the localities furnishing the required quartzite. I do not, however, propose entering now into the region of pure speculation, as future discoveries will probably add much to our knowledge about the quartzite folk.

V. *Connection with Antiquities of the Second (or Neolithic) Stone Period.*

Besides the stone weapons of the first or Palæolithic period, a few examples have been found in the area under consideration, belonging to the Neolithic, or second Stone period. These were: Firstly, a small polished hatchet, apparently of greenstone, found near Arconum, to the west of Madras. Secondly, half of a small perforated circular hammer, polished, and made apparently of a fine grained basalt or greenstone. These are in the Calcutta Museum. Thirdly, a very small polished hatchet-head, found near Nellore, and now in my possession.

A striking proof of the greatly superior antiquity of the Palæolithic period to the Neolithic is furnished by the fact that stone circles and tumuli, ascribed by the natives to a mythic tribe, called the Kúrúmbers, have been constructed of laterite rock, on the surface of lateritic beds, containing quartzite implements.

Such is the case close to the village of Amerumbardoo, before referred to as the spot where I obtained an implement imbedded three feet below the surface of an undisturbed bed of clayey laterite. A little distance N. and N.W. of the place, a large number of rude stone circles and tumuli occur on the top of the laterite bed in question. Most of the tumuli have been opened by natives, in search of treasure, which these KúrúMBER graves are popularly supposed to have abounded in.

Each of the opened tumuli showed a rude kistvaen, made

of small cut blocks of laterite rock ; the rings, on the contrary, consisted only of rough blocks of laterite. The cut blocks were no doubt quarried from a soft bed, and have become hard and glazed on the surface by subsequent weathering. It was in a small rain-gully, draining the small plateau occupied by these graves, that I found the polished fragment of a perforated hammer adverted to above. The position of these neolithic graves is exactly analogous to the position of the Gallo-Roman graves on the surface of the implement-yielding gravels at Abbeville and Amiens.

It would be a very interesting fact if any quartzite implement should be found imbedded in any of the blocks used in the construction of these neolithic graves ; and, as the laterite of the immediate environs has yielded a large number of implements, it is far from improbable that a more careful search than my hurried visit admitted of would lead to such a discovery.

I noticed similar Kúrumber rings of laterite blocks standing on lateritic beds in several other places in that neighbourhood, but nowhere else did I note the kistvaens of cut stone.

About five and a half miles E.S.E. of the railway junction at Arconum, a large circular encampment, consisting of a double fosse and double vallum, has been formed on the slope of a broad back of rising ground, covered with very sandy laterite shingle. By the natives it is said to be the work of the Kúrumber Rajah, which in other words states its origin to be prehistoric. I got no remains of polished implements in connection with this rude work, but from a small rain-gully, leading away from some tumuli and rings standing about two miles south-west of the encampment, I got the first of the polished celts mentioned above. It had from its position evidently been washed down by heavy rains from, and most likely out of, one of the rifled tumuli. Traces of another very large Kúrumber encampment, but of square shape, and with a simple vallum, thrown up on the surface of the lateritic-conglomerate, occurs seven miles N.E. of Arconum Railway Junction. Close to the edge of the fosse I picked up an implement, which had most likely been exposed by the excavation of the fosse.

In conclusion, I would remark that the purposes to which stones are now applied by the natives throw but little light on the manner of employment of the quartzite implements, and but little more on that of the neolithic weapons.

I once observed a broad tongue-shaped piece of hornblende rock used as a net sinker. It was roughly hewn, and perforated at the thin edge for the passage of the fastening to the net.

As anchors, the catamaran men use heavy lumps of gneiss or other rock, but they prefer using cut stones, such as small



broken pillars got from ruined pagodas. The only really interesting example of stone implements still employed, is the stone mallet used by the quarrymen at Trichinopoly, of which I give a figure, taken from Mr. Henry F. Blanford's '*Report on the Cretaceous Rocks of Southern India*.*' A similar two-handed mallet, with a heavy iron head, is used by some of the iron smelters in Salem

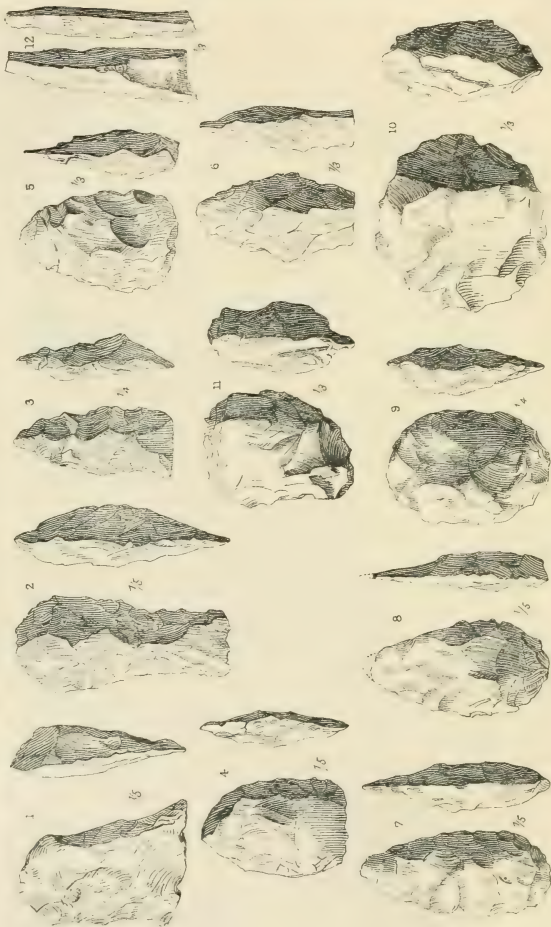
Fig. 7. district.

The PRESIDENT congratulated Mr. Foote upon the great importance of his discovery of these quartzite implements.

Sir WALTER ELLIOT, K.C.S.I., said that their existence threw a great deal of light upon the character and manners of the ancient people who dwelt in India.

Mr. J. W. FLOWER observed that Mr. Foote's researches were extremely valuable, with reference to that most important and interesting subject, viz. the forces by means of which the stone implements of the drift were carried to their present position. Mr. John Evans and Mr. Prestwich, in their papers upon the subject, had attributed the transport of these implements, in France as well as in England, to the agency of existing rivers, or rather to rivers running in the same channels, and that view had been adopted by Sir John Lubbock. It appeared, however, to him, that the evidence by no means warranted this conclusion. It did not follow, as of necessity, that all valley gravels should have been carried into the valleys by the rivers now flowing through them. In many localities both drift-gravel and flint im-

* See Memoirs, '*Geological Survey of India*,' vol. iv. part 1. p. 203.



plements were found on lofty hills and high table-lands, in England and France, far remote from any river, or river channel. Now, Mr. Foote's discoveries afforded another strong argument against the theory of river transport. The Indian implements are of precisely the same forms as those found so abundantly in the valley of the Somme and in the Little Ouse valley, and not improbably they were of the same age. These, according to Mr. Foote, were found embedded in a thick mass of laterite clay, capping the summit of a lofty range of cliffs, overhanging the sea; and the rivers of the country, some of which are of great depth and volume, are found cutting this line of cliffs to the depth of 300 feet, and this at right angles with the coast line. It is thus obviously impossible that the present rivers, or any others running in the same courses, could have formed this laterite, or brought down the implements which it contains; and if so, is it not probable (certainly it is far from impossible) that the drift implements of Norfolk should have been deposited where we find them by some other agency than that of the existing rivers? Like effects will follow like causes, whether in India or in England.

Explanation of Plate.

- Fig. 1. Axe or wedge; Attrampakkam Nullah.
- Fig. 2. Axe, with a cutting edge all round, found near Woodecotta.
- Fig. 3. Axe, with a pointed end, from Davendavancum.
- Fig. 4. Axe, nearly approaching the oval type, from the Attrampakkam Nullah.
- Fig. 5. Small spearhead,* from the Red Hills plateau.
- Fig. 6. Small spearhead, from the Attrampakkam Nullah.
- Fig. 7. Oval implement, with cutting edge all round, long variety.
- Fig. 8. " " " medium variety.
- Fig. 9. " " " short variety.
- (All three from the Attrampakkam Nullah.)
- Fig. 10. Discoidal implement (slingstone?), from Amerumbadoo.
- Fig. 11. Scraper,* found at Cummumbaucum.
- Fig. 12. Flake knife, from the Attrampakkam Nullah.

(All the above localities lie in the north-western and northern parts of the Madras district.)

* Implement found imbedded in the hard laterite rock, out of which it had to be chiselled.

ON ANCIENT SEPULCHRAL REMAINS IN SOUTHERN INDIA,
AND PARTICULARLY OF THOSE ON THE NILAGIRI
MOUNTAINS.

BY SIR WALTER ELLIOT, K.C.S.I.

DURING the year 1840, I passed several months on the Nilagiri Hills, a detached plateau in the Syhadri range of mountains, which stretches along the western side of southern India. It comprises an extensive tableland, from 6,000 to 8,000 feet above the sea, 45 miles long by 14 broad, beautifully diversified by hill and dale, the slopes clothed with groves of natural wood, through which rivulets of clear water find their way to the low country. Many of the elevated ridges are conspicuously occupied by stone cairns; and occasionally on the slopes and in the valleys, stone circles and earthen mounds may be observed, which, on closer examination, appear to mark deposits of the dead.

Before entering on a more detailed notice of these it may be premised, that such remains are of frequent occurrence throughout India.

The most common kind are circles, formed by small rough stones placed side by side, sometimes within a larger ring or a square of similar stones, in which are buried one or two earthen vessels containing incinerated bones, and sometimes a few beads or pieces of rusty iron. Occasionally, as in some examples examined by Captain (now Major-General) F. C. Cotton, in Canara, the deposit is found on the outer edge of the circle, at a spot on the east side, where a single stone projects beyond the curve.

They exist in considerable numbers throughout the whole of Southern India, from the Nerbudda to Cape Comorin, and probably extend to Upper India also. An extensive series of them may be seen at the Red Hills, near Madras, the necro-

polis of an old, deserted town or fortress, called Porel or Pulal-Kotai, once the capital of a people called Curumbars, of whom more presently. They are scattered in several groups over a considerable area, some consisting entirely of small circles, others with the addition of more elaborate structures, formed of four or six large stone slabs set up on end, with a top or covering stone, inclosing a square or oblong chamber, and occasionally surrounded by a ring of small stones, of the same construction as the single circles, but of larger diameter. The common people call them *kurungu-kals*, or 'monkey-stones,' a corruption, according to the better informed, of *Curumbar stones*, but the generic name applied to them in all parts of the country is that of *pandu-kulis*.*

At another locality near Chittoor, in the province of Arcot, a circular aperture is seen in the centre of each front stone (fig. 4), which may have been for the introduction of offerings, but which the villagers believe to have been entrances to the dwellings of a race of pigmies or troglodytes, whence the place has got the name of the 'dwarf city.' In a *pandu kuli* of this description, Captain Francis, Madras Engineers, whilst making the road from Cananore to Coorg, found three earthen vessels in the N.E. corner, a necklace of clay beads covered with gilding, a string of hexagonal cornelian beads marked with white lines, some crystal beads, a small armlet of thin gold, two fibulæ or buttons of gold, and fragments of the same metal with bits of iron much corroded.

In other instances, as on the Naikenairy Pass between Arcot and Bangalore, on the Sherwaroy Hills in Madura, &c., examples occur of the oblong-shaped kind, divided into two chambers by a slab in the middle, the circular or semi-circular opening in the front stone being at the upper edge, with a corresponding aperture in the partition slab.

Very recently a number of *pandu kulis* with the opening in front have been found in Coorg; but instead of being on the surface, like all those already mentioned, they were

* *Pandu kuli*, literally 'house of the Pandus.' In India every remnant of antiquity, of which no better account can be given, is said to have been the work of the five Pandus, the heroes of the *Maha Bharata*, during their twelve years exile from Hastinapur, when they wandered over the whole of India.

covered by tumuli of earth. One of these was remarkable for being a double receptacle, the two chambers being constructed, side by side, with a single large covering slab, thirteen feet by nine feet nine inches, and the front stones *each* with an 'aperture of an irregular segmental form, about one foot eleven inches by one foot eight inches at the top, and immediately below the superincumbent stone.'*

A description 'of some ancient graves near Oopulgutt' in the Nizam's territory, was sent by Captain Robert Young, employed on the Hyderabad Survey, to the Madras Literary Society in 1822-23. These, like the last, appear to have been subterranean kists of the same form as the common *pandu kulis*, the spot being marked by a 'number of rough, unhewn stones, placed perpendicularly on the earth's surface, with which a circle is formed, the stones, usually twenty-two in number, being near to each other, and generally touching.' The interior of this circle was filled, a little below the surface, with a sort of mortar of clay, like that found in the bottom of tanks, which was compactly beaten down over the kist. He found in them, near the eastern side, some earthen vessels filled with alternate layers of bones and earth; also, in other parts, pieces of bone, and several skulls, teeth, &c., which crumbled into dust on exposure, all except one skull, which remained in good preservation, and which Dr. Voysey considered to be that 'of a female Hindu, with no resemblance to the Malay type.' From the number of skulls it seemed that the remains of several bodies had been deposited in each kist.†

All the tombs above described, whether above or below ground, have something of a common character, the type of which is shown at fig. 4; but on the western coast a very distinct variety is met with, although still retaining the vernacular name of *pandu kulis*. They are frequent throughout the province of Malabar, and extend above the ghats into Coimbatore, where they occur in great numbers along the

* Proceedings of Asiatic Soc. Beng. for 1868. pp. 116, 151, 184, with plates i. ii. iii.

† Transactions Madras Lit. Soc. 4to. Lond. 1827, p. 26; see also Malcolmson in 'Journ. As. Soc. Bengal,' iv. 180.

valley of the Noyel river,—a range coinciding with the limits of the ancient Chera kingdom. The commonest kind are situated on the tops and sides of eminences, and are indicated by a convex or discoid slab, six to eight feet in diameter, called a *kodi-kal*, or ‘umbrella-stone,’ from its resemblance to a *kodi*, or native umbrella (fig. 3). It covers a chamber excavated in the ground, to which access is obtained without disturbing the cover, by a passage on one side and a descent of a few steps, closed by an upright stone at the bottom. The chamber is fitted to receive a large vessel of coarse earthenware, like an amphora without handles (fig. 2), four or five feet high and three or four in diameter, the mouth of which is covered by a small convex stone. At one side of this cavity is a shelf on which are placed smaller vessels, utensils of metal, &c. In one of the large vases examined by Mr. Babington in 1819, at Chata-peramba (lit. ‘the field of death’), an extensive necropolis near Beypoor,* he found on raising the stone lid a number of smaller vessels of various forms, all containing burnt bones mixed with fine shining powder or sand, except one, which was saucer-shaped and glazed, in which lay a string of crystal beads. Other beads and bits of iron, like knives, lay on the shelf.

Mr. Babington describes another variety, in which the convex disk is raised above the ground, and supported on three or four upright unhewn pillars. No remains have been found under any of these that have been examined, to indicate their purpose, whether monumental, sepulchral, or religious. They are called *topi-kals*, or ‘cap-stones,’ and have much the appearance of gigantic mushrooms (fig. 1).

The great antiquity of these structures is shown by the absurd traditions of the present inhabitants regarding them. ‘They are ascribed,’ says a MS. account of those in the Arcot district, prepared for Colonel Mackenzie, Surveyor-General of India, ‘1. To a desire of obtaining shelter from a predicted shower of fire about the beginning of the æra of

* Description of the Pandoo-Coolies in Malabar, with Four Drawings. By John Babington, Esq., in ‘Transactions Bombay Literary Society,’ vol. iii. p. 324, 4to. Lond. 1823.

Salivahana.* 2. To certain pigmies, that lived towards the end of the Dwapara-yuga. 3. To the five Pandavas, as a refuge from the persecution of Duryod'hana. 4. To the votaries of an ancient goddess, named Nila mucari, for the offer of her monthly sacrifices. 5. To the Vedar and Curumbar (huntsmen and savages of former days), as places of protection for their wives and children from wild beasts. 6. To certain men in the time of Ráma, who had monkey's tails, whence these pits are by some called *vali kudi*, or "tail houses." 7. To Racshasas or demons, as places of safety for their families. 8. To a custom of very early times after the deluge, when men lived so long as to be a burden to themselves and their relatives, so that the latter put them into earthen receptacles, with a supply of provisions, and left them to die.† Similar to these are the traditions in Malabar, according to Babington: 'By some they are supposed to be the works of the Pandavars, and by others they are attributed to the gods and genii. One very absurd origin is given to them, and is most generally credited; it is, that, at some very early period of the world, men did not die, but after increasing in stature gradually, for a number of years, they dwindled to pigmies of a few inches in length, when they ceased to eat and drink, or to perform most of the other functions of animal life, and were in this state of doubtful existence inclosed in these tombs with the implements and arms they had used when in enjoyment of their faculties.'‡

The cairns (as they are now called) on the Nilagiris, differ from all those above described, and likewise exhibit considerable diversity of structure among themselves. Some occupy the summits of hills, others are found only on their sides or in retired valleys. Many of the sites are remarkable for their natural beauty, as if the piety of the survivors had selected the loveliest and most secluded retreats for the resting-places of the departed.

The commonest, or rather perhaps the most conspicuous

* Salivahana's æra commenced A.D. 78.

† Second Report on the Mackenzie MSS., by the Rev. W. Taylor, in 'Journ. Madras Lit. Soc.' vol. vii. 305. See also Fourth Report, vol. viii. 32.

‡ Trans. Lit. Soc. Bombay, iii. 326.

sort, are those perched on the tops of hills or ridges. Their form is that of a circular wall of uncemented rough stones from four to five feet high, three feet thick, and six to eight feet in diameter, having much the appearance of a draw-well. The Todas call them *p'hins*,* a word also signifying 'pot' in their dialect (fig. 6). Others are constructed of unhewn stones, from two to five feet and more high, and two or three broad, set up on end in a circle (fig. 7). Examples also occur, though more rarely, of conical earthen tumuli (fig. 10), and of circular cavities lined with stones, from which the ground slopes down on every side (fig. 5).

Diversified as they are in form, the interior arrangement is nearly alike in all. On removing the surface soil, one or more long, narrow slabs of undressed stone are discovered lying horizontally and (where there are more than one), parallel to each other, all invariably in the same direction, viz. from N.E. to S.W. (figs. 9, 11). On digging deeper, the spaces between the stones and between these and the inclosing wall are found to be filled with red, unglazed pottery, more or less broken, as if carelessly cast in. The vessels are generally tall, cylindrical, and with many rings or zones, and the bottoms rounded. They have no handles, but are furnished with lids surmounted by rude figures of buffaloes, deer, elephants, tigers, birds, snakes, or men. Sometimes the fancy of the potter has produced monstrous shapes, as of birds with double heads, beasts with hands, &c. (figs. 12, 13, 14, 15, 18, 19, 20, 21). On clearing out this debris, and removing the horizontal stone, one or more round, flattish, earthen vessels are seen, with or without covers, sometimes entire, sometimes crushed by the weight of the superincumbent stone. They contain a few burnt bones and fine black or brown mould, together with gold ornaments, metal rings, beads, &c. In others are found cups or vases of bronze, or of a bright white alloy of zinc and copper, domestic utensils or weapons, as spears, knives, sickles, razors, tweezers, &c., generally of iron much oxidised, but sometimes of bronze. Traces of charcoal, resin, and other matter, which may have been left among the ashes of the funeral pile, also occur.

* Harkness, 'Descr. of a Singular Race on the Neilgherries,' p. 33, Lond. 1832.

A statement of the results obtained from the excavation of one or two of the most remarkable cairns may prove interesting, and at the same time convey a clearer idea of the nature of such deposits.

On the road from Ootacamund to the Koondahs, shortly before reaching the open space called the Elephant plain, the remains of an ancient site may be detected on a careful examination of the space between the road and the stream below it. Two lines of streets can be traced by the mounds and irregularities of the ground, and the foundations of buildings of cyclopean masonry are visible in several places, particularly on the banks of the stream. On the opposite side is a beautiful grove, inclosing an open slope covered with green sward, to which the English have given the name of Fair Lawns. It was one of the *teriris*, or sacred places, of the Todas, the present dominant race on the hills, and is named by them Wuzoor-mort, and by the Badagas, or agricultural inhabitants, Waka-mund. From this the ground ascends towards the Nanjanád road, between which and the grove lie the cairns to be described. From the Nanjanád road the ground continues to rise towards the remarkable peak known as One-Cairn-Hill.

The cairn first selected for examination was of unusual form. It consisted of two circles opening into each other. The smaller (fig. 7) was about eight feet in diameter, imperfectly inclosed by large upright stones, from three to four feet high; the larger (fig. 8) was surrounded by a wall of weather-worn stones and pebbles piled loosely on each other, with no approach to the regular construction of the *p'hin* or draw-well kind. The inner area of this was $14\frac{1}{2}$ feet in diameter, the outer 27 to 30 feet at the base, according as the stones had spread less or more.

On clearing out the interior to the depth of a foot or eighteen inches, eight long stones were laid bare, two in the smaller, six in the larger inclosure, all parallel, lying N. E. and S. W., three of the middle ones being contiguous to and touching each other (fig. 9). They were surrounded by a rude pavement of small stones, broken pottery, &c., below which lay great quantities of the ringed vases with grotesque lids, all

more or less fractured, intermingled with earth, charcoal, &c. When all this was removed, the slabs were seen to rest on the original, undisturbed, red soil.

The stone marked A was first raised. It was three feet four inches long, and on clearing away the loose soil, a chatty or vessel of very friable earthenware was discovered. It was lodged in a cavity dug to receive it, under the centre of the stone, and fell to pieces on being touched. In it was a metal cup like that at fig. 27, two gold ornaments, some fragments of coral, and two red beads, one of which was very small. One of the gold articles was a sort of pendant, like that at fig. 34 but smaller, not wrought with a graver, but formed of strips of gold twisted into the required shapes. The other (fig. 29) was the setting of a drop, which, from some minute fragments remaining, appeared to have been a blue stone, or bit of glass.

Under the next stone, B, which was five feet long, another flat chatty of a finer kind of pottery was found, containing spicula of burnt bone and a small metal vase or bottle of elegant form, modelled on the design of a flower-bud or calyx (fig. 23); but it had unfortunately been broken, and the tall stopper forced on one side. It seemed to be made of iron covered with the alloy of zinc and copper, of which some of the cups were made. It was coated with green oxide, and was probably intended to contain some liquid, or perhaps collyrium for the eyes, but nothing satisfactory could be ascertained from the fragments into which it crumbled.

In the space between this and the next stone, C, but nearer the latter, several vessels were found resting on stones, one of which was of the ringed variety, upright and quite perfect with its lid on. Nothing was found in it, or in the others, but a little black earth at the bottom. The principal deposit under the centre of C, a large flat vase, had had a cover which had been pushed aside, and both were broken by the covering stone. From its size and its position nearly in the middle of the circle, a valuable find was expected, but on carefully sifting the earth and roots with which it was filled, we were disappointed. Nor was the search under the two next stones, D and E, which were somewhat smaller than the others, more successful. But a continuance of the exca-

vation throughout the whole area, to the depth of about four feet, was rewarded by the discovery, at the extreme verge of the circle, close to the wall on the east side, and nearly opposite the end of E, of a fine bronze tazza, much corroded, 3·9 inches high, 2·2 deep, and 6·2 in diameter. The sides were fluted, round the outer edge was a scroll pattern, and from the centre rose a heavy, solid, oval knob, one inch high, which, together with the stand, had become detached. Similar knobs, the purpose of which is not very apparent, were found in several other cups. Within it were two gold fibulæ, with horizontal rings or hasps at the back to fasten them (fig. 30), a piece of wood, and several bits of decayed cloth.

The sixth stone, F, was now raised, and below it appeared a large flat chatty thirteen inches in diameter, imbedded in the red soil, and covered with an ornamented lid (fig. 17). It contained a tazza of bright white alloy (fig. 27), in which lay a brass cylinder, with the remains of an ivory stopper (fig. 25) and three gold ornaments, a pendant formed of strips of gold twisted into scrolls like that described under the first stone (fig. 34) but larger, and two moniliform rings (fig. 31). All these were lying on a piece of unbleached brown silk, like that now called *tusseh*, which hung over the sides of the cup, but crumbled to pieces on being touched. Besides the tazza there was a white metal finger ring, an iron razor wrapped in cloth, a rod for applying collyrium to the eyes (fig. 26), fragments of bone, and a lump of friable substance like burnt incense or pumice-stone.

This seemed to complete the exploration of the larger circle, and the excavation was therefore carried on through the passage into the smaller one at the same depth, of about four feet down to the virgin red soil. Just within it, and about a foot from the first upright stone in the S.W., the pick descended unexpectedly on a large terracotta vessel of the same flat shape as the others, and covered with a lid pierced full of holes like a cullender (fig. 17). It rested on a thin circular plate of metal with a short triangular handle, which appeared to be a mirror. Inside the chatty was a metal cup with fluted rim, and a conical knob on the bottom, and five gold ornaments; a round plate, with a ring to hang it by, and which was a crescent (fig. 36); two circular fibulæ of

open work, with a stone or bit of glass in the centre, and hasps at the back for attachment (fig. 35), and two moniliform rings, perhaps earrings, a little different from each other (figs. 32, 33), and larger and heavier than those found under F (fig. 31). Besides these there were three rings of white metal, a collyrium rod (fig. 26), an oval piece of ivory, the end or cover of something made of wood, but all crumbled into decay, remains of cloth, &c. Further on was another flat vessel filled with black earth and charcoal, among which was a smaller earthen vessel like a cupel, with a lip for pouring (fig. 22).

The excavation had now reached the horizontal stone, G, which was six feet two inches long, one foot broad, and from one to eight inches deep at different parts of its length. Immediately under it, at the farther edge, a handsome spear head was got, 7·5 inches long, 1·3 inch broad, with a raised rib along the centre, the base and part of the centre covered with the alloy of which the cups are made, which was richly chased (fig. 28). Nothing was at first visible under the stone, but, on digging down a few inches into the red soil, which exhibited occasional traces of charcoal and charred wood, a small flat stone was reached, below which a fractured terracotta chatty of very fine red clay was disclosed, the surface glistening with scales of talc, and contained the following articles:—

Two small lance heads.

Two razors.

A sickle, with broken handle, and the remains of the wood in which it had been set.

Three small hollow cylinders, resembling figs. 23 and 25, but ruder, smaller, and containing a yellowish powder.

Two chisels.

A double ring of white metal.

A style for applying collyrium (fig. 26).

Fragments of ivory, wood, and bone? apparently.

A quantity of yellow grains about the size of split peas, which were resinous, cellular, and irregular in shape, like bits of incense.

A lump of greyish, friable substance, which fell to pieces on exposure to the air, together with a little black earth.

The last stone, H, was larger though not so long, measuring five feet eight inches by three feet seven inches at the broadest, to two feet three inches at the smaller end, and eight to ten inches thick. It had the usual flat chatty under the centre, which was crushed, but had no cover or superimposed stone. It was filled with a rich brown mould, intermixed with a few small pebbles, but not a trace of ashes, charcoal, or organic remains. A field rat had made its burrow under the stone in a direction slanting downwards, and large enough to admit the arm.

This completed the search, which had occupied five whole days.

Hard by, on an eminence between the two sources of a rivulet running down to the main stream, one of which divided it from the uplands of Kelgode, or One-Cairn-Hill, the other from the grove of Fair Lawns, was a conical mound about eight feet high, surrounded by a fosse (fig. 10), which was next examined. The following were its dimensions:—

Diameter of the whole, from the outside of the raised bank	Feet.
bounding the fosse	80
Breadth of the outside bank at the base	22—24
" " " " top	12—13
Breadth of the fosse at the top	9
" " bottom	4
Circumference of the cone at bottom	76
Which gives a diameter of	25·3
Diameter of the truncated top	13

A trench was first run through the bank and the fosse to the base of the cone, which showed them to be formed of the earth displaced for the construction of the tumulus. The top and sides of the cone were then cleared of the shrubs and bushes which covered it, and the investigation was continued from the top downwards. At a depth of a foot, or eighteen inches, four long stones appeared lying N.E. and S.W. (fig. 11), and parallel to each other; the first stone, I, near the edge of the cone, which was here from fourteen to fifteen feet in diameter. The space

Between I and the next stone K was 23 inches			
K	"	L	17 "
L	"	M	20 "
M	and the outer edge		38 "

These spaces were filled with quantities of the broken ring pottery, which was cleared out, and the stone, I, rolled over the side, but nothing was found under it. Under the farther edge of K lay an iron sickle and a razor, but no deposits under the stone itself, which was propped up at the N.E. end by a number of soft, yellowish clay stones, firmly wedged under it. The opposite side of the cone was also partly built up of the same material, probably as a support to the loose earth.

In the space between K and L lay a smallish flat chatty with a coarse, saucer-shaped cover, filled with earth and matted roots, among which was a piece of bone of the tibia, white and calcined. To the left of this, towards the N.E. edge, a large tazza of the bright white alloy was turned up, lying reversed and empty. On one side of it lay a lump of the light, cellular, greyish-yellow substance, which was met with in the former cairn, and under it a razor and a sickle, the wooden handle of which was still wonderfully perfect. The stand of the tazza had come off, and just inside the rim was a smaller piece of yellow resin like gamboge.

Under the centre of L was a flat chatty with a cover of fine pottery, in which was a piece of blackened bone of the femur, a thin circlet of gold, like a child's bracelet, and two tiny earrings (figs. 37, 38), also only fit for a child.

There now remained only the last stone, M, the removal of which disclosed, at the depth of a foot below its bed, a thick, solid bronze cup with a bell-shaped lip (fig. 39) lying on its edge, against the upper side of a large, covered, terracotta chatty, of the finer kind of pottery. Leaning against the tazza was an iron chisel, and below the chatty a sickle, and near it an iron style. On removing the lid of the vessel a long splinter of calcined bone was perceived, together with a gold ornament exactly like fig. 30, save that it had not a stone in the centre.

Nothing more was discovered, and having reached the virgin soil on a level with the outer surface, our two days' search ended.

If a conjecture might be hazarded, the double circle may be supposed to contain the remains of a man and woman of

rank, and the tumulus those of a child, perhaps the heir of the chief of the neighbouring city, and the hope of his tribe, prematurely cut off, and his ashes thus conspicuously consigned to their last resting-place.

During my stay on the hills I excavated fourteen of these deposits, almost all of which yielded interesting discoveries, of which I possess full details. The fame of my success spread through the station, and excited a rage for 'cairn hunting,' as it was called. In the course of the following two or three years every tomb on the plateau was rifled, and unfortunately no record of the results, which must have yielded many curious particulars, has been preserved. One gentleman alone opened forty-six cairns,* and was still engaged in the work when he published a paper on 'The Antiquities of the Neilgherry Hills,'† which dwells more on a theory to prove that the Todas (assumed to be descended from the constructors of the cairns) are a Scythian colony, than on the exact results obtained from such extensive operations. Many of the excavations, moreover, were made in a hasty, superficial manner, by careless explorers, who destroyed the edifice without gratifying their expectations.

The hypothesis which assigns these deposits to the ancestors of the Todas is unsupported by any other authority, and is contradicted by many considerations. To persons unacquainted with the Hills, it may be necessary to explain that their inhabitants differ remarkably from the people of the plains. They consist of four well-marked tribes. The Todas, though few in number, not exceeding 350 souls, hold the first place; next come the Badagas, the most flourishing class, devoted to agriculture, about 6,500; the Kotas artisans, who also cultivate, about 300; and the Curumbars, inhabiting the unhealthy slopes of the plateau, may be as many more.

The first are nomade herdsmen who, in virtue of their pretension to be considered the oldest occupants, receive from the Badagas and Kotas a tribute called *goodoo*, which is paid in kind.

* Madras Journ. of Lit. and Science, xiv. 145.

† By Capt. Congreve, *ibid.* pp. 77-146.

But though claiming superiority over all the lands of the plateau, they tacitly admit the rights of the poor, despised Curumbars to an older title. These wretched outcasts, living in the depths of the forest, emerge from their retreats on the occasions of the great Toda festivals, and at the Badaga seasons of seedtime and harvest, and receive from both an acknowledgment of their claims by the payment of a certain amount of produce. Both Todas and Badagas hold them in mortal dread, believing them to be possessed of magical arts, by means of which they would avenge themselves if their rights were refused.

Now it is a remarkable fact that the Todas, who are proverbial for their respect for the dead, disclaim all interest in the cairns, and willingly conduct strangers to them for the avowed object of plundering their contents. On the other hand, the Curumbars have been known to exhibit a timid repugnance at the proceedings of cairn-hunters, although not daring to interfere.*

The Rev. F. Metz, a German missionary who has for several years devoted himself to the Hill population, and is the only European who has acquired a knowledge of their dialects, has published an account of them, in which he attributes the cairns, 'if not constructed by a race now extinct,' to the ancestors of the Curumbars.† He adduces several additional reasons in support of his view,‡ and if it can be shown that these ancestors were formerly a flourishing people, the supposition will be greatly strengthened if not confirmed.

Evidence of this fact is not wanting. At a very early

* I state this on authority of an intelligent Toda, who was for several months in my service as a guide. Capt. Ouchterloney also confirms the fact.—'Memoir of Survey' in *Madras Journ.* xv. 51.

† *The Tribes of the Neilgherry Hills.* By a German missionary, p. 108. Madras, 18mo. 1856.

‡ Among these is 'the common tradition among the Todas, Badagas, and Kotas, that they are the graves of a very wicked race of people who, though diminutive in stature, were powerful enough to raise immense blocks of stone; and that God drove them from the hills on account of their wickedness.'—*Ibid.* p. 110. This tale harmonises well with the circumstances of the Buddhist persecution, the votaries of that creed being to this day stigmatised by all orthodox Hindus as atheists and necromancers.

period the greater part, perhaps the whole, of the southern districts, anciently called Dravida-desam, the modern Carnatic, in which the Tamil language is spoken, was occupied by a people called Curumbars. In the province of Arcot they formed a powerful federal community, which extended from Madras to Nundedroog in Mysore, composed of twenty-four states called *kottams* or castles, each containing four or five *nadus* or provinces, and each *nadu* many *nattams* or townships.*

They professed the Buddhist faith, which had been successfully propagated under Asoca, autocrat of India in the third century B.C., a creed peculiarly favourable to the progress of art and literature. The community had attained to a highly flourishing condition, when it was overwhelmed by the first great persecution of that creed in the sixth century. The Chola sovereign of Tanjore, at the head of a large army, defeated the forces of the Curumbar federation near Pulal-Kotai (now the Red Hills, seven miles N.E. of Madras), and overran the whole country. Stimulated by religious hatred he exterminated the Curumbars with unsparing cruelty, and founded a new capital at Conjeveram in the very heart of the confederacy, at the same time changing the name of the region to Tondamundalam.

The Curumbar name is still found attached to several places in the south, and a whole district in Malabar preserves the name of Curumbar-nádu to this day. We have no account of the progress of the Buddhist persecution in the west, but it was probably completed with equally unrelenting severity. There can be little doubt that the poor savages, dragging a precarious existence in the unhealthy forests of the Western Ghats, are the fugitive remnants of the civilised people, once the dominant race of the land. Those who found a refuge in the unfrequented solitudes of the mountain plateau, may have maintained their independence for some time longer, till dislodged by the sturdier Toda herdsmen, who, from their physical characteristics, appear to

* F. W. Ellis, 'Replies to Seventeen Questions, &c. relative to Mirasi Right.' Madras, fol.

belong to the warlike tribes represented by the Poligar and predatory castes.

In 1808, Mr. William Garrow, collector of Coimbatore, wrote to Colonel Mackenzie,* that a number of ancient silver coins (fig. 40)† had been found in a *pandu-kuli* of the *kodi-kal* type at Chavadepalyam in that district, which proved to be identical with some others discovered four years previously in a field at Penar, also in Coimbatore, among which was a denarius of Augustus. Roman coins are of frequent occurrence in India. In 1842 a pot containing 522 denarii of Augustus and Tiberius, with a few of Claudius and Caligula, was dug up near Coimbatore, which must have been buried at the time that the *pandu-kulis* were used as receptacles for the dead. Another coin was found at the time the first English dwelling was erected on the Nilagiris in 1824. Mr. Sullivan, the collector, had selected a place in Ootacamund on which there had been a cairn, which was cleared away by the workmen without exciting attention; but Mrs. Sullivan, in walking over the debris, picked up a gold coin and a bronze bell. The former, which had been worn as an ornament, is much defaced, but looks like a Byzantine solidus;‡ but the figure on the reverse has so much the attitude and character of a Hindu figure, that I am inclined to refer it rather to one of the Indo-Scythic kings, probably to Kanerki.§ A sealing-wax impression of it was sent to James Prinsep, but he could make nothing of it.

These facts all go to confirm the popular belief in the great antiquity of the *pandu-kulis*. We shall probably not err greatly in concluding, that all the different varieties belong to a race which has disappeared (at least in a civilised condition) from the existing population, and in assigning to their sepulchral remains an age of from 1,600 to 2,000 years.

* Mackenzie MSS.

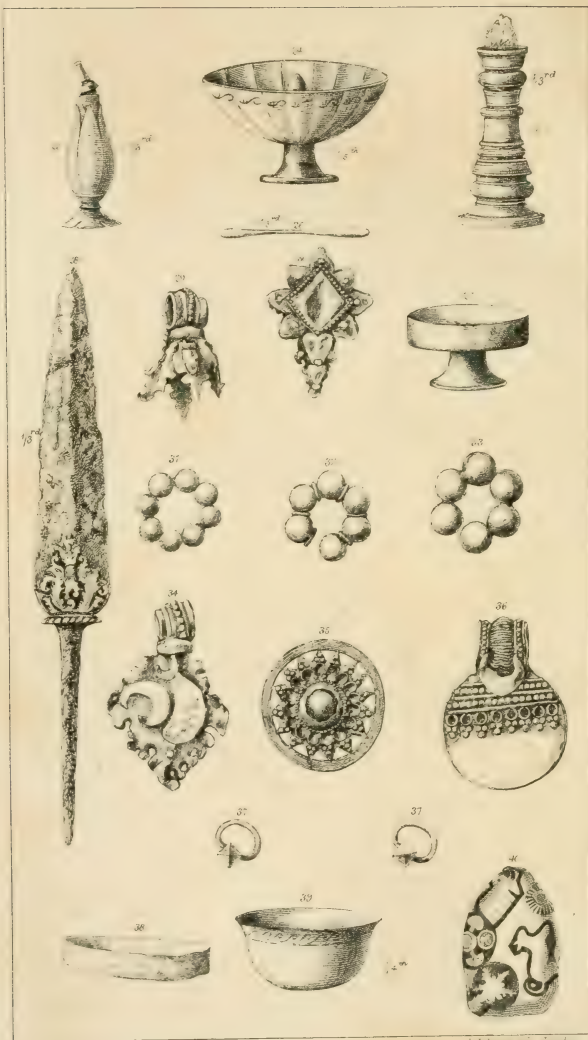
† 'Numismatic Gleanings,' in Madras Journ. xix. (new series iii.) p. 226-230, plates vii. viii.

‡ I possess a solidus of the Emperor Zeno, which was found in the Madura district.

§ Wilson, 'Ariana Antiqua,' plate xii. figs. 6, 9, 10, 11.

General COTTON passed a high eulogium upon Sir Walter Elliot, and drew attention to the vast amount of knowledge which he had brought home from India. He had won the Star of India from his country for his services in the civil department of the government, while in every department of science he had interested himself. There was an enormous amount of material brought forward by Sir Walter, which had never yet been worked up, and which was worthy of the greatest attention.

During the day Mr. Fitch's collection of flint instruments was exhibited. They had been collected principally from Norfolk and Suffolk, including the neighbourhood of Santon Downham, Thetford, Diss, Hoxne, &c. There were four cases illustrating the implements of the early Stone period, and two cases illustrating the polished or later Stone period. They included some fine specimens of axes, hatchets, chisels, hammer stones, &c.



NILAGIRI SEPULCHRAL REMAINS

Plate 10. Nilagiri, Nilgiri Mts.



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NILAGIRI SEPULCHRAL REMAINS



Fig 9

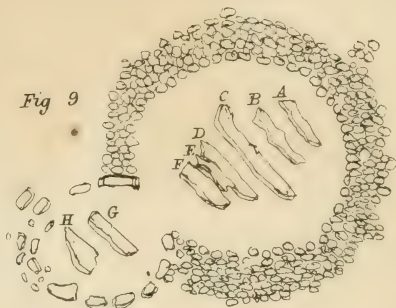


Fig. 7

Fig. 8.

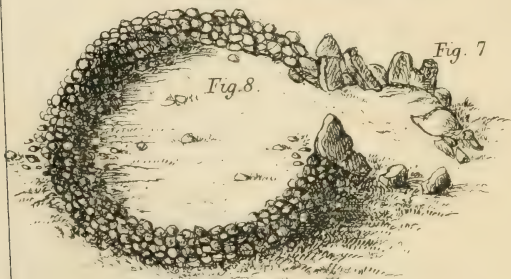


Fig. 10.



Fig. 11.

I E Elliot, Del.

Fig. 1.

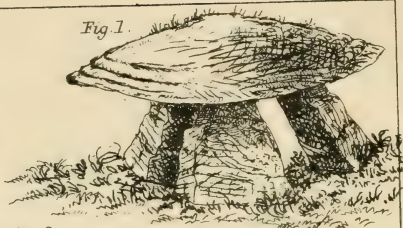


Fig. 2.



Fig. 3.



Fig. 4.

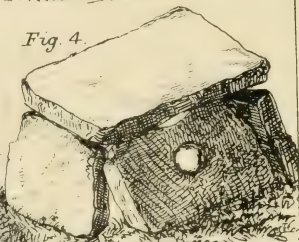


Fig. 5.

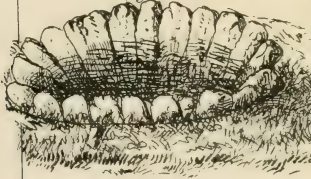
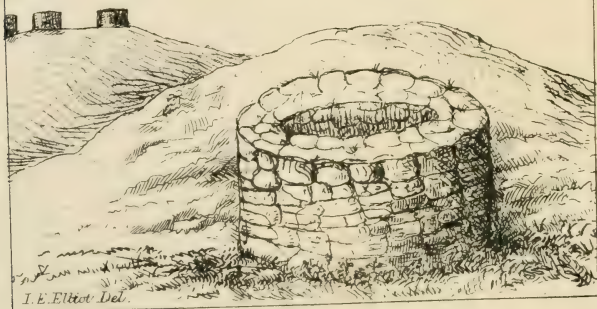


Fig. 6.



I. E. Elliot Del.

Explanation of the Plates illustrating Indian Sepulchral Remains.

Pl. I. fig. 1. A pandu-kuli, of the kind called topi-kal; Malabar.

Fig. 2, 3. A pandu-kuli of the kind called kodi-kal; being a subterranean chamber, covered by a large convex stone, underneath which is deposited an earthen-vase, fig. 2; Malabar. N.B. The word pandu-kuli signifies the 'pit or hole of the Pandus;' from Pandu, a name of celebrated Indian princes, and kuli, or kuzhi, a 'pit,' 'excavation,' &c. பாண்டுக்குழி.

Fig. 4. A pandu-kuli of the commonest form, constructed of four stone slabs covered by a fifth. They are generally above ground, but are sometimes found under the surface, and covered with earth. Some have a hole in the centre, or at the upper side of the front stone; others have none. They are occasionally surrounded by one or more concentric circles of small stones, or by a circle and a parallelogram. From all parts of Southern India.

Fig. 5. A concave, excavated tomb, lined with large upright slabs; Nilagiri Hills.

Fig. 6. A tomb of the sort called 'p'hin,' by the Hill people, on the tops of hills. The artist has, of his own fancy, introduced a figure, to show the relative size of the structure, but which is inappropriate, inasmuch as none of the inhabitants use bows and arrows.

Pl. II. fig. 7. A circle formed of large upright slabs of stone; Nilagiris.

Fig. 8. A wide circle of small stones loosely piled on each other; Nilagiris. N.B. In the tomb here represented these two kinds of circles have been conjoined, so as to form a single tomb or deposit—a very unusual circumstance.

Fig. 9. Section through the two circles, showing the surface soil removed, and displaying the horizontal stones covering the deposits.

Fig. 10. A conical tumulus, surrounded by a fosse; Nilagiris.

Fig. 11. Section through the line *a* to *b*, showing the horizontal stones under which the remains, &c. are found.

SIXTH MEETING.

WEDNESDAY, AUGUST 26.

SIR JOHN LUBBOCK, BART., PRESIDENT, IN THE CHAIR.

The Congress met at 11 A.M., when the following Papers were read:

NOTES ON THE DISCOVERY OF STONE IMPLEMENTS
IN JAPAN.*

By A. W. FRANKS, Esq., M.A., V.P.S.A., F.G.S.

THE attention of archæologists has been frequently called to the remarkable similarity that exists between the stone weapons of countries far removed from each other. This has been by some brought forward as evidence of the unity of origin of the human race over the whole extent of the globe and at all periods; by others as betokening that a similar state of civilisation must necessarily produce similar results.

It is not, therefore, very surprising that the distant islands of Japan, that land of mystery and exclusion, should produce stone weapons and implements almost undistinguishable from those of other lands, and which, like most of the latter, may be referred to a prehistoric period.

The first to call attention to the Japanese specimens was the late Colonel von Siebold, who in his magnificent but unfortunately incomplete work, 'Nippon,' has given three plates of such objects, Part II., Pl. xi. xii. xiii. I should add that three bone shafts in Plate xi. are from the Aleutian Islands, and an axe in Plate xiii. from the South Seas, having been added by Von Siebold for the purpose of illustration.

* The writer, having since had an opportunity of seeing the collections at Leyden and Copenhagen, has somewhat amplified this paper.

The specimens collected by Von Siebold chiefly passed into the Ethnographical Museum at Leyden with his first collection of Japanese objects. His second collection, now at Munich, does not appear to contain any stone implements. The Leyden specimens are 126 in number, consisting of 102 arrow-heads, 4 lance or dart heads, 7 knives, scrapers, &c., 1 chisel, 4 celts, and 8 miscellaneous ornaments.

Twenty specimens from Von Siebold's collection, duplicates of those above noticed, were obtained in 1838 for the Museum of the Society of Northern Antiquaries, and are now in the Ethnographical Museum at Copenhagen. They are noticed in the 'Aarsmode,' or annual report of the Society, printed in 1839, where three specimens are engraved. Eleven additional specimens were presented in 1853 by Dr. O. Mohnike, and three were obtained from other sources, making a total of 34 examples at Copenhagen, consisting of 25 arrow-heads, 2 lance-heads, 1 knife, 1 adze, 3 celts, and 2 other specimens.

In looking over a small collection of minerals which had evidently been formed in Japan by a native, and which was chiefly fastened down in Japanese lacquer trays lined with red silk, I discovered twenty stone implements, in some cases accompanied by Japanese labels. They consist of 1 flake, 13 arrow-heads, 1 large arrow-head or knife, 2 lance-heads, and 3 celts. Nine of them are exhibited in the following Plate (see page 267).

We have thus 180 stone implements from Japan as materials for determining their form and character, and the specimens may be divided into the following classes: I. Flakes. Of these we have but one, such rude specimens not having probably attracted the attention of the Japanese collectors of curiosities. II. Arrow-heads, which may be subdivided into the following types: *a*, simple fusiform or lozenge-shaped; *b*, leaf-shaped; *c*, leaf-shaped, with a tang; *d*, with a tang and barbs; *e*, cruciform; *f*, barbed, without a tang; *g*, triangular; *h*, with a broad fan-shaped blade, diminishing towards the tang. III. Lance-heads, generally narrow and fusiform. IV. Knives, chiefly made of slate with two indentations at the base to fix the handle, and usually a curved blade. V. Scrapers or chisels made by chipping. VI. Celts,

some of them with an oval, others with a quadrangular, section; they vary in length from $8\frac{1}{4}$ to $2\frac{1}{4}$ inches.

Von Siebold's specimens were chiefly obtained for him by the imperial physician, Katsuragawa. The arrow-heads are stated to have been discovered on the sites of ancient cemeteries, Kami-halls, caves, and waste places, as well as on the shore of the sea and banks of rivers. Von Siebold gives a list of some of the principal places where they are found, which appear to be chiefly in the northern part of the great island of Nippon, in the Jebisu-no-kuni, or Land of the Wild Men.

Such relics of the past seem to be much sought after and collected by mineralogists and others in Japan; and they are considered by the Japanese as remains of the time of the Kamis, or spiritual inhabitants of the country, and are treasured up in the chapels and Kami-halls as sacred reliques of some value.

The same singular fancy as to their heavenly origin seems to exist in Japan that is prevalent in Europe, Asia, and the West Indies. The celts are considered thunderbolts, or as the battle-axe of Tengu, the Guardian of Heaven; the arrow-heads to come from heavenly hosts fighting among themselves. Such showers of arrow-heads are mentioned in Japanese chronicles.

For instance, in A.D. 839, it is stated that, in the land of Dewa, after a long-continued storm which lasted a week, the whole ground of the shore was covered with stones, although there had been none visible before. Some of these were arrow-heads, others lance-heads, and they were white, black, green, or red.

Similar showers of arrow-heads are recorded to have taken place in the same land of Dewa on two occasions in the year 885.

Another writer states that the reason for these relics being so often found in the land of Dewa is that every year an army of spirits passes across that district, accompanied by storm and rain, and that the arrows are then dropped, and that for this reason the inhabitants go out after heavy storms to seek for arrow-heads, especially after storms of

rain, when they are found, particularly on the sand of the shores.

It need hardly be said that these phenomena are to be accounted for by the heavy rains washing away the particles of earth or sand, and so bringing to light the arrow-heads before unnoticed.

The author of a great Japanese work on mineralogy (the *Un-kon-sie*) has classified the various forms of arrow-heads, and given engravings of many varieties, and some of Von Siebold's figures are borrowed from him.

In presenting the specimens above mentioned to the Society of Northern Antiquaries in 1853, Dr. O. Mohnike, then a physician in the Dutch East-Indian army, furnished the following particulars, which, by the kindness of M. C. Engelhardt, have been extracted for me from the archives of the Society.

‘Such stone weapons are frequently found in all parts of the Japanese empire, especially in the northern part of the isle of Nippon. The stone celt (13,708) was found in Tsi-kūzen on Kiusiu; the three arrow-heads (13,709) are from Fizen, a province of Kiusiu; the other arrow-heads (13,710—13,713) from Oos-jou, a northern province of Nippon. Such old stone weapons are frequently met with in cultivating the ground, strewn over the fields, sometimes even in or near old cemeteries; yet rarely and exceptionally, because in Japan, more perhaps than anywhere else, the graves of the forefathers are looked upon as holy and not to be disturbed, so that they are rarely opened.

‘These stone weapons are found either singly, or associated with small urns of burnt clay, and different ornaments of stone or precious metals, gold and silver. These ornaments of stone are commonly formed of rock crystal, obsidian, chalcedony, and other semi-precious stones, perforated like beads, and have in bygone times been strung as necklaces. Bracelets and finger-rings of gold, thick and massive, are of very rare occurrence.

‘All the above-named objects of stone, as well as the arrow-heads (*jasiri-no-isi*, i.e. arrow-head stones), the battle-axes (*rai-funo-seki*, i.e. thunderbolt, or *Tengu-no-masakari*, i.e.

Tengu's battle-axe), and other stone implements, more like knives or bolts of cross-bows, are ascribed by the popular belief to the Kamis, or ancestors of the Japanese people. Therefore, a greater or smaller number of them is found in many temples of the Kami worship, the older and original religion of the country. I saw them myself in a journey to Jedo in various temples. In Japan it is popularly believed that such arrow-heads and battle-axes fall down from heaven in thunderstorms.

‘Though the useful metals may have been known in Japan, perhaps even before the commencement of our era, I believe that they were at first imported from China, and employed but rarely in Japan earlier than the seventh or eighth century after Christ, when copper-mines were discovered. Before that time, and, in some parts of the country, perhaps even until the ninth or tenth century, stone weapons and instruments were probably the common things, and most frequently used; yet we find far earlier traces in the Japanese writers of the use of copper swords. When iron was introduced is unknown.’

It has been stated that stone implements are most frequently met with in the northern part of the great island of Nippon, and Von Siebold remarks that this district is occasionally called Jezo by Japanese writers, and was therefore most probably inhabited by the same wild tribes who still dwell in the island of Yezo.

That the use of stone implements continued late in countries neighbouring on Japan is shown by a notice in the well-known Japanese historical work, the ‘*Niponki*,’ written in 720 of our era, in which it is stated that, in the spring of the year 27 before Christ, a ship went to Japan from Sinra in Corea, with a son of the king of Sinra on board, who brought to Japan presents for the Mikado, including spears of stone.*

Stone weapons are even still in use among the natives of the Kurile Islands. One almost identical with that represented in the plate, fig. 8, was sent to Mr. Bragge, of Sheffield, by Colonel Zaroubin, as still in use in the Kurile Islands

* Siebold, French ed. t. v. p. 138.

for killing game. It is of a dark silicious stone, and has been presented by Mr. Bragge to the Christy Collection. The more usual stone implements in those islands seem to be slate arrow-heads, not unlike those of the Esquimaux.

In the neighbouring empire of China, civilisation commenced at a much earlier period than in Japan, and the use of stone implements must generally be referred to a still earlier date, as shown by the native tradition, which ascribes the invention of stone weapons to the second mythical emperor, Chin-Nung.

Mr. E. B. Tylor, in his 'Early History of Mankind,' p. 207, has collected some notices of a Stone Age in China, and has referred to a remarkable passage in Grosier, '*Description générale de la Chine*' (Paris, 1818, vol. i. p. 191), from which it would appear that stone implements are still occasionally used. In describing the city of Nan-hion-fou, in the province of Kouan-ton, Grosier says, 'On trouve dans les montagnes et parmi les rochers dont ses environs sont hérissés une pierre pesante et si dure qu'on en fabrique des haches et d'autres instruments tranchants.' The same writer, however, states elsewhere (vol. ii. p. 209), 'On ne trouve à la Chine aucune de ces anciennes pierres tranchantes travaillées pour suppléer à l'usage du fer; du moins les lettrés actuels n'en ont jamais entendu parler.' His first statement was therefore probably taken from some ancient Chinese work.

A curious passage, also quoted by Mr. Tylor, from a Chinese encyclopædia made for the Emperor Kang-hi (1662),* describes stone axes under the common name of lightning stones; it is as follows:—

'The shape and substance of lightning stones vary according to place. The wandering Mongols, whether of the coasts of the Eastern Sea, or the neighbourhood of the Sha-mo, use them in the manner of copper and steel. There are some of these stones which have the shape of a hatchet, others that of a knife, some are made like mallets. These lightning stones are of different colours; there are blackish ones, others are greenish. A romance of the time of the Tang

* *Mémoires concernant l'Histoire, etc., des Chinois, par les Missionnaires de Pékin.* Paris, 1776, etc. vol. iv. p. 474; see also Grosier, vol. ii. p. 253.

says that there was at Yu-men-si a great Miao, dedicated to the Thunder, and that the people of the country used to make offerings there of different things to get some of these stones. This fable is ridiculous. The lightning stones are metals, stones, pebbles, which the fire of the thunder has metamorphosed by splitting them suddenly, and uniting inseparably different substances. There are some of these stones in which a kind of vitrification is distinctly to be observed.'

Through the kindness of Dr. Birch, I have received a notice of stone implements in a Chinese work, communicated to him by the eminent Chinese scholar, M. Stanislas Julien, membre de l'Institut.

In the 'Ping-tseu-loui-pien' (book xlii. fol. 38), in the treatise on various kingdoms, a work attributed to one of the disciples of Confucius, occurs the following passage:— 'Whilst Confucius was in the kingdom of Tchin, some hawks had collected together on the roof of the palace of the prince of Tchin. They were all dead, and their bodies were trans-fixed with arrows made of khou wood, and with stone heads. These arrows were one foot eight inches long. Hoei-Khong, prince of Tchin, sent a man with one of these hawks to the dwelling of Confucius, to ask him the meaning of it. Confucius said, "This hawk comes from a far country; this arrow is of the invention of So-tchin. Formerly, after that Wou-Wang of the Tcheou dynasty had conquered the emperor of the Changs, he opened out roads even to the nine barbarians, and to the hundred barbarians called *Man*, and ordered them to bring as tribute the productions of their country, that they might remember their duties as tributaries. Then So-tchin offered as tribute arrows made of khou wood with points of stone."'

From the mention in this curious passage of the Emperor Wou-Wang, the event to which it relates may be referred to about 1100 years before Christ.

The same story is related somewhat differently in the life of Confucius by Père Amiot ('Mémoires sur les Chinois,' t. xii. p. 325), as quoted by M. Chevreuil, membre de l'Institut, in a note on the Stone Age in China communicated by him to the Academy of Sciences in Paris ('Comptes rendus,' vol. lxiii. p. 281). From this account Confucius further said that Wou-

Wang, who founded the kingdom of Tchín, gave one of the arrows with stone points as a mark of sovereignty to the new king, and that no doubt it would be found in the royal treasury, which proved to be the case.

M. Chevreuil had received from M. Stanislas Julien several notices of stone implements in Chinese works, of which the following are the principal :—

1. In the dictionary, Ping-tseu-loui-pien, above mentioned, it is stated that in the district of Sin-thou-hien is a spot called Pe-yang-kio, where is a level plain. In ancient times there was here a military camp and a tower, and in digging the earth, stone arrow-heads (*chi-tsien*) are found all over it.

2. In the annals of the Song dynasty (A.D. 964–1279), in the life of Tchang-sun, are mentioned soldiers armed with arrows having stone points. They were probably Tartars.

3. In the annals of Northern China, composed under the Thang dynasty (A.D. 619–907), it is stated that in the country to the east of Fo-ni, all the arrows had stone points.

4. In the annals of the same Thang dynasty are mentioned stone-axes (*chi-fou*).

In various other passages are mentioned a stone knife (*chi-t'ao*), a stone sword (*chi-kien*), and an instrument of agriculture in stone (*chi-jin*).

With so few facts to guide us, it would be useless to attempt to draw any conclusions from the existence of stone implements in Japan and China. It is evident that a Stone Age once existed in both countries, and it is probable that it lasted longer in Japan than China. It must, however, have passed away in the latter country at so early a date that, in the ninth century of our era, its relics had assumed a mythical character, and were discovered buried in the earth; while in both countries, the use of stone implements by barbarous nations beyond their confines appeared sufficiently remarkable to be noticed by the chroniclers.

The PRESIDENT doubted whether there was as yet sufficient evidence to justify us in concluding that there had been an exclusive Stone Age in Japan, though he thought it very probable that we should find that there had been a Stone Age in every part of the world.

Description of the Plate.

Fig. 1. Arrow-head of grey chalcedony neatly chipped, with barbs, but no tang.

Fig. 2. Arrow-head of white milky chalcedony; the barbs have a curved outline, approaching in form some of the specimens from Denmark. The ends are rather knobbed, though not so much so as an arrow-head from Denmark in M. Rasmussen's collection, published in Madsen, *Afbildninger*, Pl. xxxix. fig. 27.

Fig. 3. Arrow-head of pale buff flint, very singular in form, the barbs terminating in a broad end. This form seems peculiar to Japan.

Fig. 4. Leaf-shaped arrow-head of dark yellow jasper, the end contracting so as to form a tang, of which a portion is now wanting.

Fig. 5. Arrow-head of red and yellow jasper, neatly chipped, with a delicate tang and slightly projecting barbs.

Fig. 6. Arrow-head of variegated agate, red and grey, with small tang and sharp barbs. One side of the blade is convex, the other flat.

Fig. 7. Coarse arrow-head or knife of dark grey slate, roughly chipped, and partly ground.

Fig. 8. Javelin or spear-head of pale buff flint or jasper, neatly chipped; it is fusiform, and one end is slightly imperfect. There is in the collection part of a second of grey flint. A similar specimen may be found in the Leyden Museum.

Fig. 9. Small axe-head of greenish stone, very carefully made and polished; the sides are at right angles to the blades, as may be seen by the section. This material seems to have been not unfrequently employed in Japan for axes.

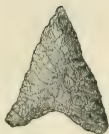


Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.



Fig. 7.



Fig. 8.



Fig. 9.

ON THE PREHISTORIC MAMMALIA OF GREAT BRITAIN.

BY W. BOYD DAWKINS, M.A., F.R.S., F.G.S.

AT the time man first appeared on the earth, the physical conditions obtaining in Western Europe were altogether different from those under which we now live. Britain formed part of the mainland of Europe, and low fertile plains, covered with the vegetation peculiar to a moderately severe climate, stretched far away into the Atlantic, from the present western coast line.* The Thames also, instead of flowing into the German ocean, joined the Elbe and the Rhine in an estuary, opening on the North Sea about the latitude of Berwick. The climate also was very severe, and strongly resembled that of Siberia and North America. One would naturally suspect that the animals living on that vast pleistocene continent, under those conditions of life, would differ materially from those now living in what are the mere relics of that submerged land. Some of them have utterly disappeared from the face of the earth, such as the sabre-toothed lion, the cave bear, the Irish elk, the mammoth, *Elephas antiquus*, the hippopotamus, the woolly rhinoceros, and *Rhinoceros leptorhinus* of Owen. Others again have departed to northern regions, such as the glutton, the reindeer, the true elk, the musk sheep, the pouched marmot, and the lemming; while others, such as the cave lion and cave hyæna, have retired southwards, and taken refuge, the one in Africa, the other in that continent and in Asia.

Among the extinct mammalia may also be reckoned the post-glacial dwellers on the banks of the Somme and in the caves of the Dordogne, as well as those who in our own

* See 'Address to Geological Section of British Association, 1868.' By R. A. C. Godwin-Austen, F.R.S., president.

country inhabited the caves of Pembrokeshire, Somerset, and Devon. They have passed away as utterly as the mammoth.

The epoch during which the post-glacial mammals dwelt in Britain is removed from the beginning of history in Western Europe by an interval of unknown duration. On looking back, indeed, on it from the stand-point of history, we feel as if we were on the top of a lofty mountain, gazing over the lower ground as far as a distant range, that rises up sharp and clear against the horizon, the minor hills and valleys in the middle distance being dwarfed and obscured by the background. The British post-glacial period stands out so prominently, that the middle distance—the interval between it and the dawn of history—has received little attention in Britain.

In the following essay I have collected all the mammalian evidence at my disposal relating to this prehistoric epoch—an epoch of uncertain length, to be reckoned possibly by centuries, and possibly by tens of thousands of years. The human remains found in Britain, and belonging to the Stone and Bronze folk, have been diligently looked after by the archaeologists and craniologists, but the remains of the animals, carefully sought after in Switzerland and Denmark, have for the most part either been overlooked in this country, or confounded with the animals of the post-glacial age. They have been derived from villages and tumuli of unknown antiquity, from refuse heaps, and from caverns which were the abodes and burial-places of some early race of men. Unfortunately I cannot separate those belonging to the Stone folk from those living in Britain during the Bronze Age. The remains found in tumuli and villages will be first considered.

In 1862 I had the opportunity of examining the remains at Stanlake, a small hamlet in Berkshire. They were found in and around the circular depressions and trenches, which mark the site of a village probably of Keltic age. They consisted of large quantities of the bones, teeth, and skulls of animals that had been used for food, such as *Bos longifrons*, in great abundance, the sheep or goat, the horse, red deer, pig, the dog, wild cat, and marten. The metacarpal of a roe

* *Archæologia*, vol. xxxvii. p. 363. *Proceed. Soc. Antiq.* vol. iv. p. 93.

deer had been polished, and exhibited the marks of friction by a string. Along with them were large quantities of flint flakes, rudely-chipped lumps of flint, and coarse pottery and ashes. There was nothing found to stamp the absolute date of the village, but it may have been inhabited at the time of the Roman invasion. In the tumuli of Wiltshire the same group of animals has been met with by Dr. Thurnam, with the exception of the cat and marten.

In the same county also, the skull of *urus* * has been found underneath a tumulus near Calne, associated with remains of the deer and wild boar, and fragments of pottery ornamented with right lines. A second instance of the occurrence of the animal along with traces of man is afforded by the remarkable discovery in the fens of Cambridgeshire of a skull with a portion of the stone celt, with which the death-blow was inflicted, still lodged among the bones.

A vast number of bones have been dredged out of the Thames near Kew Bridge along with polished stone axes and bronze swords. Their condition proves them to have belonged to animals that were eaten for food, the horse, *Bos longifrons*, pig, sheep, goat, red-deer, and roe-deer. There were dredged up also with them several human skulls, that had been gashed and partially cleft, and Roman horse-trappings. The river at Kew is shallow, and when we take the number of bronze swords into consideration, some of them even with the metallic end of the scabbard still on the blade, the human skulls, and the Roman phaleræ, it is very probable that it was the site of a battle between the Kelts and the Roman legions. All that can be said with reference to the date of the accumulation of bones is, that it was probably anterior to the time of the Romans. A little higher up the river, near the new waterworks, a similar deposit of bones was discovered in the beginning of the year 1867. I found on examination that large oaken piles had been driven into the gravel which anciently formed the bottom of the Thames, and that a quantity of brushwood, principally of willow, had

* Fossil skull of *Ox*, by Henry Woods, A.L.S. 4to. Lond, 1839. The skull has since been proved to have been obtained from a bed of river gravel. (Some Account of the Blackmore Museum, p. 51.)

been pressed in between them. On the top was a large quantity of bones, broken more or less for food, and belonging principally to *Bos longifrons*. The whole was covered with alluvium from four to five feet in thickness. It is very probable in this case, that the piles are the remains of dwellings somewhat similar to those in the Swiss lakes; there were, however, no fragments of pottery and no implements, the only human remains being some of the long bones.

We will now pass on to the consideration of the prehistoric caverns in Britain which have afforded traces of the abode of man. In 1859 I explored a small cave at the head of Cheddar Pass in Somersetshire. The mammalia found in it consisted of the wolf, fox, badger, wild boar, goat, roebuck, *Bos longifrons*, and horse. A human skull also from this cave is preserved in the Oxford Museum, which is very well developed, and may have belonged to a person of considerable capacity. During the exploration of caverns in Somersetshire by Mr. Sanford and myself in 1863,* a second cavern of prehistoric age came before our notice; also in the mountain limestone of the Mendip range, in Burrington Combe, a magnificent defile about twelve miles from Bristol. It was situated high up in the ravine, and was very nearly blocked up with earth mingled with charcoal. It contained a large quantity of the remains of *Bos longifrons*, red-deer, goat, wolf, fox, badger, rabbit, and hare. In the lower portion of the cave we disinterred fragments of a rude urn, of the coarsest black ware, devoid of ornament, and with the rim turned at right angles, together with a piece of bent iron, which more closely resembles those found strengthening the angles of wooden chests in Roman graves on the banks of the Somme, than anything else we have seen. The accumulation of bones and charcoal prove that the cave was inhabited by man for some considerable time. The interment is clearly of a later date than the occupation, because it is made in the mass of earth, bones, and charcoal, which resulted from the latter. The interval between the two is of doubtful length. In the same year we explored another cavern in the same ravine, which consisted of two large chambers, connected to-

* Proceed. Somersetshire Arch. and Nat. Hist. Soc. 1864.

gether by two passages not more than a few inches high. The natural entrance, but a little larger than a fox-hole, was in the roof of the first chamber, and through this we had to let ourselves down into the cave. Subsequently we blasted a second entrance. The first chamber was at least half full of broken rocks, covered with a mortar-like mass of decomposing stalagmite. Underneath them was a group of four skulls, one of which belonged to the *Bos longifrons*, two others were those of a species of the goat tribe, approaching more closely to the *Ægoceros Caucasica* of Asia than any other recent species, in the oval section of the horncores, in their parallelism to one another, and their slight backward curvature. We have met with a similar form in a refuse heap at Richmond, in Yorkshire,* and in the disturbed soil on which London stands; and M. Lartet writes me that he has detected it in a cave in the Pyrenees. In the absence, however, of the necessary materials for comparison from the museums of London, Oxford, and Paris, I do not feel justified in proposing a new specific name, as it may possibly belong to a variety of *Capra hircus*. The fourth skull belonged to the pig, and had a round hole in the frontals rather larger than a crown piece, which had the appearance of being made by human hands. The presence of the lower jaws with the skulls indicates that they were deposited in the cavern while the ligaments still bound them together. They were all more or less covered with decaying stalagmite. The outer chamber was remarkable for the absence of earth of any kind, except underneath the hole in the roof, where there was a very little; while the inner one, running in the same slope, has its lower end entirely blocked up by a fine red earth, deposited by a stream which flows during heavy rains. Between the stones on the floor were numerous bones and teeth, of wolf, fox, mole, arvicola, badger, and bat, along with a metacarpal of red-deer and the remains of birds. How the animal remains were introduced, for they exhibit no marks of gnawing, and there are no fragments of charcoal in the cave, or any other traces of man, is altogether a matter of conjecture. But the fact of finding the skulls in one group,

* Quart. Geol. Journal, November, 1865.

coupled with the presence of the hole in the frontals of the pig, leads us to believe that they have been introduced by the hand of man. The entrance was far too small to admit of an ox falling into the cave by accident, and scarcely large enough for a goat or deer to squeeze themselves through; had they been brought in by wolf or fox, the bones would have exhibited marks of teeth.

In 1863 Mr. James Parker explored a cave in the limestone cliffs at Uphill, near Weston-super-Mare, and obtained human skulls and bones, along with rude pottery and charcoal. I have determined the presence of the following animals: the wild cat, wolf, fox, badger, *Bos longifrons*, pig, red-deer, dog, and water rat; most of the remains belong to young animals, and some are gnawed by dogs, wolves, or foxes. The Heatheryburn Cave, in Durham, explored by Mr. John Elliot in 1862,* yielded, besides the remains of man, those of the otter, badger, goat, roe-deer, hog, and water-rat.

These caves present no trace of the post-glacial fauna, but contain merely the remains of the animals associated with man in prehistoric times. There are some, however, in which the remains belonging to these two very distinct epochs are found in close association. In Kent's Hole, overlying the mass of bones dragged in by hyænas during the post-glacial epoch, and in places covered by stalagmite, there was a stratum of dark earth, containing the remains of the feasts and fires of some ancient people, bone implements, chert and flint arrow-heads, a hatchet of syenite, sandstone spindle-whorls, shells of mussel, limpet, and oyster, a palate of scarus, and numerous fragments of pottery made by hand, ornamented with zig-zag indentations, not unlike those from the barrows of Wilts. The latter, in ornamentation and texture, is identical with that obtained by the Earl of Enniskillen from the bears' den of Kùhloch, and that from the pile dwellings of Switzerland, in the collection of the late Mr. Christy. In some places the stalagmitic floor had been broken through, apparently for purposes of sepulture, and human bones and flints of all forms, 'from the rounded pebble

* Geol. Mag. 1862. See also Proc. Soc. Ant. second series, vol. ii. p. 127.

as it came out of the chalk, to the instruments fabricated from them, as the arrow and spear-heads and hatchets were confusedly disseminated through the earth, and the whole agglutinated together by stalagmite. Flint cores were lying by the side of the flakes cut from them.* The remains of the animals found in the same layer belonged to the wild boar, red-deer, fox, rabbit, and small rodents, and are in part preserved in the museums of London and Oxford. The bovine meta-tarsals and -carpals in the latter museum belong to the small short-horn *Bos longifrons*. The fragments of charcoal imbedded in the adherent matrix prove that they also were derived from the upper prehistoric stratum. It is an open question whether these remains belong to the age of Stone or of Bronze, but the absence of the latter material renders it probable that the cave was inhabited by neolithic savages, closely allied to those whose remains are found in hut circles and tumuli.

The Paviland Cave, described by Dr. Buckland,† affords another instance of the mixture of post-glacial and prehistoric remains. To the one period belong the elephant, rhinoceros, horse, bear, and hyæna; to the other, the so-called woman's skeleton (which equals in size the largest male skeleton in the Oxford Museum), the bones of ox and sheep (or goat), the whelk, limpet, periwinkle, littorina, and trochus, and small ivory rods. The presence of the remains of sheep underneath the bones of elephant, bear, and other post-glacial mammals, coupled with the state of the cave earth, which had been disturbed before Dr. Buckland's examination, proves that the interment was not of post-glacial date. No traces of sheep or goat have as yet been afforded by any post-glacial deposit in Britain, France, or Germany.

The mammalia associated with man, as we have seen in the hut circles, tumuli, and caves, occur also in caves, peat-bogs, and alluvia, in association with other species. By putting the two groups together we can form an adequate idea of the entire group of animals that inhabited Britain,

* Cavern Researches, by the late Rev. J. Mac Enery, F.G.S.; edit. E. Vivian, 1859.

† Buckland, 'Reliquiæ Diluvianæ,' 4to. 2nd edit. 1824, p. 90.

from the disappearance of the post-glacial mammalia down to the time of the Roman invasion. Professor Owen* quotes a cave at Arnside Knott, near Kendal, that yielded wild boar, brown bear, and other existing species. The Manea fen in Cambridgeshire has yielded the brown bear; the peaty mud near Newbury, the bear, wolf, otter, wild boar, horse, water-rat, red-deer, roe-deer, goat, Irish elk, *Bos longifrons*, and urus; the peat and marls of Ireland, the Irish elk, *Bos longifrons*, red-deer, and wild boar; the peat of Hilgay in Norfolk has furnished the beaver and Irish elk. The reindeer also occurs in some eight or nine places in Britain, either in the peat or in the underlying marls. Professor Owen figures in the 'British Foss. Mammals,' fig. 197, a skull with antlers from a subturbary deposit in Bilney Moor, near East Dereham, in Norfolk. He also gives a figure of a metatarsal bone from the Fens of Cambridgeshire. A third case was afforded during the excavation at Crossness Point, on the southern bank of the Thames, near Erith, which was made for the reservoir of the southern outfall of the Metropolitan sewage. A fine antler was obtained from the bottom of a layer of peat, varying from five to fifteen feet in thickness, along with the remains of beaver, *Bos longifrons*, goat, horse, and a human skull. This is the only instance that has come before my notice of the association of reindeer with man in any British prehistoric deposit. A tracing of an antler sent me by Mr. Tiddiman, of the Geological Survey, brings the number of cases of its occurrence in England up to four. The original was found in a shell-marl underlying the peat near Whittington Hall in Lancashire. Nor was it much more abundant in Scotland.† In 1775 some of its antlers were found by Dr. Ramsay, professor of Natural History in Edinburgh. Antlers also were obtained in 1833 from the alluvium of the Clyde, along with a skull of the great urus.‡ In 1865, Sir Philip Egerton met with a small fragment of antler in the peat bogs of Rosshire, which beyond all doubt belongs to this animal.

* British Fossil Mammals.

† Pennant, 'Quadrupeds,' vol. i. p. 100.

‡ Edinburgh New Philosophic Magazine, 1852, vol. lii. p. 135.

The first instance of its occurrence in Ireland is afforded by some sketches of antlers found in 1741, in the bog of Ballyguiry, by Major Quarry, which have been in the possession of that gentleman's family ever since. In the preface to the 'Zoologist' for 1836 the animal is recorded from Lough Gur, in the county of Limerick. In 1847 Mr. Oldham (now Dr. Oldham) brought before the notice of the Royal Dublin Society the 'skull, horns, and lower jaw of a reindeer found by Mr. Moss at Ballybeta, near the Golden Ball, in the county of Dublin;' but the most remarkable discovery was that of a perfect skull with attached antlers, brought before the notice of the Royal Dublin Society by Dr. Carte in 1863. It was found in 1861, on the verge of the Curragh Bog, near Ashbourne, in the county of Dublin. It is, beyond all doubt, the most magnificent specimen of reindeer that has ever been found in the fossil state. Dr. Carte also mentions three antlers that were found at Coonagh, on the south side of the Shannon, in county Clare. Thus in Ireland, also, the animal was rare as compared with the Irish elk or *Bos longifrons*. I have given all the cases known to me of its occurrence in Great Britain and Ireland because they have an important bearing on the climate of the prehistoric period.*

Thus by comparing the mammalia found in the burial-places and dwellings of prehistoric man in Britain, belonging either to the age of Stone or possibly of Bronze, with those found in the most recent of the stratified deposits, the turbaries and alluvia, we arrive at this important fact, that the two belong palæontologically to the same epoch. For this epoch I have proposed the term prehistoric,† believing it to be of precisely the same classificatory value as the term post-glacial or quaternary.

We will now discuss the characteristics by which it may be defined from the post-glacial epoch on the one hand, and from the period of the Roman occupation on the other. In the following table I have condensed all the information I could collect on the subject. The first three columns show the

* Popular Science Review, January 1868, pp. 39, 40.

† Introd. Pleist. Mammalia, Part. I. 1866, Pal. Soc.

numbers of the post-glacial mammals, and the relation which those found associated with man bear to the whole group. The first column is the result of a personal inspection of nearly all the collections of mammalia in Great Britain, full details of which will shortly be published by the Palaeontographical Society; the second is based on the discoveries at Hoxne, Bedford, Salisbury, and Gray's Inn Lane; the third upon those made in Kent's Hole, Wookey Hole, and the caves of Gower and Brixham. The next three show the relation that the mammalia, found associated with man during the prehistoric period, bear to those found in prehistoric caverns, alluvia and turbaries; while the last three represent all the information I can gather respecting the animals inhabiting Britain during the Roman occupation, at the time of the Norman Conquest, and, lastly, at the accession of William and Mary.

The enormous difference between the post-glacial and prehistoric faunas is to be measured by the fact that out of forty-eight well ascertained species living in the former, only thirty-one were able to live on into the latter; and that, out of those thirty-one, all, with the exception of six, are still living in our island. The cave bear, cave lion, and cave hyæna had vanished away, along with a whole group of pachyderms, and of all the extinct animals but one, the Irish elk, still survived. The reindeer, so enormously abundant during the post-glacial epoch, lived on, greatly reduced in numbers; while the red deer, which was rare, became very numerous, and usurped those feeding-grounds which had formerly supported vast herds of the reindeer. With this exception all the Arctic group of mammalia, such as the musk-sheep and the marmots, had retreated northwards; a fact which shows that the climate of Britain during prehistoric times was warmer, or rather less severe, than during the former epoch. This conclusion is corroborated by the comparison of the ice-borne gravels and the large sheets of brick earth formed by the spring floods of the one, with the evenly stratified alluvia and regularly sorted river gravels of the other. The amelioration of climate may probably be accounted for by the supposition that Britain was insulated

Table showing the Relation of the Prehistoric to the Post-glacial and Historic Mammals in Britain.

	Post-glacial Mammals, River-beds, Caves.	Post-glacial Mammals associated with Man, River-beds.	Post-glacial Mammals associated with Man in Caves.	Prehistoric Mammals in Tomb, and Declines and live deposits asso- ciated with Man.	Prehistoric Mammals associated with Man in Caves.	Prehistoric Mammals, River beds, Caves.	Mammals living during Roman occupation.	Mammals living at the time of the Norman Conquest	Mammals living at the time of William and Mary.
Homo, <i>L.</i>	x	x	x	x	x	x	x	x	x
Rhinolophus ferrum equi- num, <i>Leach</i>	x				x	x	+	+	x
Vespertilio noctula, <i>Schreb.</i>	x				x	+	+	+	x
Sorex vulgaris, <i>L.</i>	x		x		x	x	+	+	+
Talpa Europaea, <i>L.</i>	x				x	x	+	+	
Ursus arctos, <i>L.</i>	x		x		x	x	x		
Ursus spelæus, <i>Gold.</i>	x	x	x						
Ursus ferox, <i>Lew. and Cl.</i>	x		x						
Gulo luscus, <i>Fab.</i>	x								
Meles taxus, <i>L.</i>	x		x		x	x	x	+	x
Mustela erminea, <i>L.</i>	x		x			+	+	+	x
M. putorius, <i>L.</i>	x					+	+	+	x
M. martes, <i>L.</i>	x			x		+	+	+	x
Lutra vulgaris, <i>Erxl.</i>	x		x		x	+	+	+	x
Canis vulpes, <i>L.</i>	x	x	x	x	x	x	x	x	x
C. lupus, <i>L.</i>	x		x		x	x	x	x	x
C. familiaris				x	x	x	x	x	x
Hyæna spelæa, <i>Gold.</i>	x		x						
Felis catus, <i>L.</i>	x		x	x		+	+	x	x
F. lynx	x								
F. antiqua, <i>Cuv.</i>	x								
F. leo, var. spelæa, <i>Gold.</i>	x	x	x						
Machairodus latidens, <i>Owen</i>	x		x						
Megaceros hibernicus, <i>Owen</i>	x		x						
Alces Malchis, <i>Gray</i>	x					x			
Cervus tarandus, <i>L.</i>	x	x	x	x	x	+	x		
C. capreolus, <i>L.</i>	x		x	x	x	x	+	+	x
C. elephas, <i>L.</i>	x	x	x	x	x	x	x	+	x
C. dama, <i>L.</i>						x	+	+	x
Ovibos moschatus, <i>Desm.</i>	x								
Bos urus, <i>Pliny</i>	x		x	x		x	? x	? x	
Bison priscus, <i>Owen</i>	x	x	x						
Bos longifrons, <i>Owen</i>				x	x	x	+	+	x
Capra regagrus, <i>L.</i>						x	+	+	x
C. hircus, <i>L.</i>				? x	x	x	+	+	x
Ovis aries				? x	? x	? x	+	+	x
Hippopotamus major, <i>Desm.</i>	x	x							
Sus scrofa, <i>L.</i>	x	x	x	x	x	x	+	+	
Equus fossilis, <i>Owen.</i> (Ca- ballus)	x	x	x	x	x	x	x	x	x
Rh. leptorhinus, <i>Owen</i>	x		x						
Rh. tichorhinus, <i>Cuv.</i>	x	x	x						
Elephas antiquus, <i>Falc.</i>	x	x	x						
E. primigenius, <i>Blum.</i>	x	x	x						
Lemmus sp., <i>Link.</i>	x	x							
Lepus cuniculus, <i>Pall.</i>	x		x		x	x	x	x	x
L. timidus, <i>Erxl.</i>	x		x		x	x	x	x	x
Lagomys spelæus, <i>Owen</i>	x		x						
Spermophilus erythro-ge- noides, <i>Falc.</i>	x	?							
S. citillus, <i>Pall.</i>	x								
Arvicola pratensis, <i>Bell</i>	x		x			+	+	+	x
A. agrestis, <i>Flem.</i>	x		x			+	+	+	x
A. amphibia, <i>Desm.</i>	x		x			+	+	+	x
Mus musculus, <i>L.</i>	x		x			+	+	+	x
Castor fiber, <i>L.</i>	x		x	x		x	+	+	

NOTE.—x implies that the animal has been found; +, that the animal must have been living at the time, because it is found before and after.

from the mainland of Europe at the close of the post-glacial epoch.

But the prehistoric period is defined most sharply from that which preceded it by the introduction of forms of life hitherto unknown in Britain. The goat, the small deer-like *Bos longifrons*, and the dog—these three animals have been considered by eminent naturalists to belong to an epoch vastly more remote, on evidence that seems to me singularly worthless and inconclusive. The goat (*capra hircus*) has found its way into the list of British ‘newer pliocene mammalia’* because a frontlet and lower jaw were picked up on the Walton shore by the late Mr. John Brown of Stanway, and forwarded to Professor Owen, along with the remains of mammoth, rhinoceros, and hippopotamus which were found on the same shore, and for the most part cast up by the waves. The alluvial deposits in the neighbourhood are full of remains of goat, just as the remarkable fluviatile clay is full of post-glacial mammals; and both lie exposed to the wear and tear of the sea on a coast line that is rapidly advancing inland. We cannot wonder, therefore, at the remains from these two very different deposits being found side by side in the shingle. They bear to each other no closer relationship than any other two groups of waifs and strays thrown up on the same spot. This is the only case on record of the asserted occurrence of the animal with newer pliocene mammalia. Professor Gervais,† therefore, is perfectly justified in his refusal to recognise the animal as of higher antiquity than the prehistoric, or, as he calls it, the Keltic period. The evidence brought forward by Professor Owen in favour of the newer pliocene age of *Bos longifrons*‡ is precisely of the same nature. It is based on the following specimens. Two skulls washed up on the shore at Clacton, and one from Walton, also a waif cast up on the shore. A third locality is cited also in the ‘British Fossil Mammals,’ of its occurrence with urus and bison at Bricklehampton Bank, near Cropthorne

* British Fossil Mammals.

† Paléontologie française.

‡ Quart. Geol. Journ. 1867, Feb. 20, p. 176, on the British Fossil Oxen, part ii. *Bos longifrons*, Owen.

in Worcestershire. On examining the collection made by the late Professor Strickland from that place, and now preserved at Apperley Court, I found a mixture of remains similar to that of Walton. The urus and bison, to which may be added hippopotamus, were derived from brick-earth, while the remains of *Bos longifrons* were proved, by the adherent fragments of matrix, to have been derived from the alluvium close by. The remains of the urus and bison, presented by Professor Strickland to the Museum of the College of Surgeons, were obtained from the former deposit. In the 'Life and Papers of H. E. Strickland,' published by Sir William Jardine in 1858, there is no mention of the *Bos longifrons* in the list of mammals from Bricklehampton. The remains ascribed to *Bos longifrons* from Kirkdale belong to the smaller variety of the bison. The gravel-pits of Kensington are given as the fifth locality where the animal has been found associated with the extinct post-glacial mammalia. In the absence, however, of direct proof that its remains were derived from the same undisturbed gravel as the mammoth, the fact that the disturbed soil round London is full of its bones, strongly suggests the probability, that those in question were found in the superficial soil, and not in the gravel below. In the list of mammals found at Fisherton* it is quoted as having been found in association with the lemming, spermophilus, marmot, tichorhine rhinoceros, and other characteristic post-glacial species; but the remains ascribed to this animal and preserved in the Salisbury Museum belong, as at Kirkdale, to the smaller variety of bison. In fine, all the cases of its reputed occurrence, associated with post-glacial mammalia in Britain, may be resolved either into a mistaken identification of its remains with those of bison, or by the mixture of its remains with those of animals derived from a different formation.

The third animal, the dog, is stated by MM. Marcel de Serres, Dubreuil, and Jeanjean, to have occurred in the caves of Lunelviel, and by Dr. Schmerling in the caverns of Liège, along with post-glacial mammalia. In the first of

* Quart. Journ. Geol. Soc. vol. xx. p. 102: Catalogue of Blackmore Museum, Salisbury, 8vo.

these cases Professor Gervais is by no means satisfied that the canine remains really belong to the dog; and in the second there is precisely the same uncertainty. During the post-glacial epoch the wolves varied considerably in size in Europe, and it is very probable that the remains in question may have belonged to the smaller races of wolf. In Britain there is no evidence whatever of the existence of the dog in post-glacial times. In France and Germany the first indisputable proof we have of its existence is furnished by the remains found along with man in prehistoric caves, and those in the alluvia and peat-bogs.

To these three characteristic mammals found in the prehistoric deposits in Great Britain, a fourth may with very great probability be added. In Aveline's Hole, one of the caverns in Burrington Combe explored by Mr. W. Ayshford Sandford and myself, the skull of *Ovis aries* lay buried under a deposit of cave-earth twenty-six feet in thickness, along with an incisor of *Sus scrofa*. But, nevertheless, this solitary case of its occurrence in the British caves that has come before my notice is not sufficient to prove that the sheep lived in Britain during the Prehistoric Period; because the accumulation of cave-earth in the line of drainage may have taken place within the last two thousand years. In France, however, the animal has been found in many of the caverns of Aude and Gard (Gervais, 'Paléont.' p. 138), and was kept in Switzerland by the pastoral tribes of the Stone Age that inhabited the Pfahlbauten. However doubtful, therefore, its prehistoric age may be in Britain, there can be no doubt whatever that it was living at the time on the mainland of Europe.

These four animals, therefore, may be considered as characteristic of prehistoric deposits in Central and Western Europe, and as defining them as accurately as the mammoth, or the musk-sheep, those of the post-glacial epoch. Whence they came is altogether an open question; but they stand by themselves among the relics of the post-glacial fauna that lived on into the prehistoric epoch, and they appear, as it were, strangers and sojourners, although they are spread throughout the length and breadth of Western Europe. If I might hazard

a speculation it would be that they were introduced by some ancient race of men from a district to the south-east of Europe—from the mysterious land that is called the birthplace of the nations, that they were already domesticated before they arrived in Europe, and that the abundance of the goat and *Bos longifrons* in peat bogs and alluvia may be accounted for by their reversion to a wild condition of life, analogous to that of the cattle and horses in Australia and America. It is a very significant fact, that the ancient neolithic race of men, who dwelt in the pile-dwellings of Switzerland, suddenly make their appearance, possessed of these four animals. Mr. Darwin infers from their knowledge of the Egyptian wheat, and from other evidence collected by Dr. Heer, that they either still ‘kept up commercial intercourse with some southern people, or had originally proceeded as colonists from the south.’* At all events there is nothing improbable in the idea that these four animals were introduced into Europe by the hand of man, and that they were not indigenous and domesticated by him after his arrival.

The bison has not yet been recognised in any British prehistoric deposit. In France and Germany, on the other hand, it is abundant, and lived down into the historic period. Its absence from Britain may perhaps be accounted for by our island having been cut off from the mainland of Europe before the commencement of the prehistoric period, and by the animal having been consequently exposed to the craft of the hunter in an area too small for its concealment.

The existence of the true elk (*Alces malchis*) in Britain, during the Prehistoric Period, is based on the solitary occurrence of an antler at the bottom of a bed of peat, near Newcastle.† The urus, the Irish elk, and the reindeer, were very rare.

We have now to discuss the relation of the prehistoric animals to those that inhabited Britain during the Roman occupation. But first of all I will give a few instances of the discovery of animals in and around Roman camps, villas, and

* Darwin, ‘Variation,’ vol. i. p. 317.

† Trans. Tyneside Naturalists’ Field Club, vol. v. part ii. p. 111.

cities, that have come before my own notice. In 1864 I examined the remains * found by my friend the Rev. F. Warre, in the hut circles which exist within the massive fort of Worle Hill near Weston-super-Mare; that, to say the very least, was occupied by the Roman troops. They belonged to *Bos longifrons*, horse, pig and badger, and from their fractured state clearly were the relics of the food in use at the time. They were associated with the following articles of metal: spears and arrow-heads, reaping hooks and horse-trappings of iron, a ring and some coins of bronze, the latter of Constantine, Constantinus, and Crispus Valerianus. There were also red, green, and blue glass beads, clay beads, the calcined head of a femur, and a liassic nodule perforated for suspension, a ring made of a segment of the shaft of the metatarsal of *Bos longifrons*, rude pottery not turned in the lathe, lathe-turned and well-moulded Roman pottery, whetstones, flint-flakes, and one remarkable implement, pyramidal in form, with a flat base carefully chipped all round. This form was also found in the Keltic village of Stanlake by Mr. Stone, and by the Rev. H. H. Winwood in the excavations now going on in ancient Roman Bath (*Aquæ Solis*). From the latter place the remains forwarded to me belong to the roe and red deer, *Bos longifrons*, *Capra hircus*, and pig.

A collection of Roman remains, made by Mr. Thomas Honeywood, of Horsham, from a villa on the South Downs, contained the following species, red and roe deer, wolf, fox, pig, and horse, shells of cockle, limpet, and periwinkle. The villa itself had undoubtedly been destroyed by fire, for a quantity of molten lead, derived probably from the roof, had fallen on a heap of corn, and still contains within its mass the carbonised grains. The same group of animals is represented also in the refuse heaps in and around the old Roman cities of Londinium (London) and Camulodunum (Colchester). In the former, however, I have detected also the remains of the fallow-deer, as well as *Capra ægagrus*, and sheep; in the latter, in the collection of Dr. Bree, a canine of the brown bear.

In the Maidstone Museum there is preserved a collection

* In the magnificent collection of mammalia at Taunton.

made from a swallow-hole near Allington Church, consisting of remains of dog, wild boar, sheep or goat, red and roe deer, along with shells of whelks, oysters, periwinkles, Samian ware, fine black ware turned in the lathe, and Roman tiles. In all these cases it is worthy of note that a large number of the remains belong to the red and roe deer, while those of the domesticated *Bos longifrons* are incomparably greater. It is clear, therefore, that although the dwellers in Britain during the Roman occupation lived for the most part on the herds, they lived also on the products of the chase. There is, moreover, reason to believe, from the fractured condition of the remains of horse, badger, and bear, that those animals also formed part of their food. The remains of the dog, on the other hand, are for the most part perfect, and without traces of fracture or of the use of the saw.

I have also met with traces of the dog, horse, and *Bos longifrons* inside some oaken chests at Hardham, near Pulbro' in Sussex, which beyond all doubt contains interments of the age of the Roman occupation. From a coin of Hadrian (A.D. 172), found in one of them, it is very probable that they belong to the third or fourth century.*

There are also caves which most probably were inhabited during this epoch. That of Longberry Bank, near Penally in Pembrokeshire, explored by the Rev. H. H. Winwood, F.G.S., contained the remains of *Bos longifrons*, sheep or goat, badger, dog or wolf, oyster shells, limpets, mussels, flint flakes, a human vertebra, premolar, and metacarpal, along with fragments of red, fine-grained pottery, turned in the lathe, of a kind that is repeatedly found in the refuse heaps of Roman cities and villas. Some of the Craven Caves in Yorkshire also present similar evidence, and were probably inhabited at an epoch not far removed from the Roman occupation.

The most noteworthy point of difference between the prehistoric mammals and those living during the Roman occupation is, that the Irish elk had become utterly extinct, the true elk had vanished away from our island, and the reindeer

* On a Romano-British Cemetery and a Roman Camp at Hardham. Sussex Archæol. Coll. 1863.

had been banished at least from that portion that presents any trace of Roman civilisation. In other respects there seems to have been little difference in the animal life. The Roman legionaries lived upon the same wild animals, and ate the beef furnished by the small *Bos longifrons*, and the mutton of *Capra hircus* and sheep. I have not, however, met with indisputable proof of the existence of *Capra egagrus* before their advent; but it would be rash to infer, therefore, its non-existence, because a sufficient number of prehistoric groups of animals have not yet been determined to cause negative evidence to assume any high value. There is also a cloud overhanging the first appearance of the fallow deer in Britain. Not the slightest trace has been found in any British prehistoric deposit. In Britain I have only met with it in two cases, associated with remains that may be ascribed to the date of the Roman occupation—at Richmond in Yorkshire, and in London.* M. Lartet believes that it was introduced into France by the Romans. There is no proof that it existed in the latter country, in Germany, or in Switzerland, during the prehistoric period, Dr. Rutimeyer having withdrawn his identification of it in the Swiss Pfahlbanten. It may, therefore, be assumed, with a very high degree of probability, that we are indebted to the Romans for the introduction of the southern form, the fallow deer (*Cervus dama*) of our parks.

The larger breeds of domestic cattle supplanted *Bos longifrons* in Roman Britain about the time that the Saxons drove the Roman provincials into Wales, Scotland, and Brittany, or just those districts in which it still lives. The few bovine remains I have seen from Saxon interments belong to the urus type, and not to the *Bos longifrons*. It is therefore very probable, that the larger and better breeds of cattle were imported by the Saxon invader from his own country, the low lying district between the mouth of the Rhine and Jutland, an area which is now famous for the size of its oxen.

From the time of the Saxon invasion down to the present

* In the collection of Colonel Lane Fox.

day there has been but little change in the mammalian life of Great Britain, and that has been brought about, for the most part, by the destruction of wild animals, consequent on the spread of civilisation and the encroachment of pastures and tilth on the ancient forests.

The last historical notice of the beaver is that afforded by Giraldus Cambrensis, in the year 1188, when he met with the animal in the river Teivy, in Cardiganshire, on his tour through Wales to collect volunteers for the First Crusade. The brown bear became extinct in Scotland in 1057, if there be any truth in a legend of the Gordon family of the origin of their crest. The wolf, which was sufficiently abundant in the Wealden forests to eat up the corpses of the Saxons left on the field of Senlac, by Duke William,—

Vermibus atque lupis, avibus canibusque voranda
Deserit Anglorum corpora strata solo*—

held its ground in England till 1306, in Scotland until 1680, and in Ireland, protected by the misrule and anarchy of the country, until 1710. There is evidence also that the reindeer lived in Caithness in the middle of the twelfth century, the animal being incidentally mentioned in the ‘Orkneyinga Saga,’† as having been hunted, as well as the red deer, by the Jarls of Orkney. The passage is thus translated by a learned Iclander, Jonas Jonæus,‡ ‘solebant comites quavis fere æstate in Katanesum transire, ibique in desertis feras rubras et rangiferas venari.’§ Dr. Hibbert gives an elaborate critique on the passage, and agrees with the rendering of Jonæus, which would prove the presence of the reindeer (*hréina*) in Caithness at the time that Henry II. occupied the throne of England, and Alexander Neckam was writing his natural history. Professor Brandt of St. Petersburg is also of the same opinion. The author or authors

* ‘De Bello Hastingsi Carmen.’ G. Guido, Bishop of Amiens, who died 1075.

† That var sithr Jarla nær hvert sumar at fara yfer á Katanes oc thar upp á mekr at veida raudðýri edr hréina. The two Jarls in question, Ronald and Harold, hunted in Caithness, according to Jonæus, in 1159.

‡ He published in 1780 an abstract and Latin translation of the Saga.

§ Brewster’s ‘Edinburgh Journ.’ new series, vol. v. p. 50.

of the Saga must have been well acquainted with the reindeer in Norway, Sweden, or Iceland; and therefore there is nothing improbable in the inference, that the animal termed *hréina* was a reindeer. Nor is the probable truth of this inference lessened by none of the remains of the animal having been found in the area occupied by the Romans, or by the fact of its not having been mentioned by any British historian. The Romans never conquered Caithness, and the highlands of Scotland were so utterly unknown to the English of the middle ages, that even so late as the time of William III. they were looked upon very much as we now look upon the extreme north of Lapland. The hills of Caithness lie in the same parallel of latitude as the south of Norway and Sweden, in which the animal was living at the time. Reindeer-moss is abundant in Caithness, and the only condition of life wanting to make that district still habitable by the animal, is a greater severity of cold. Taking all the circumstances, therefore, of the case into consideration, I feel disposed to admit the evidence of the reindeer having lived in Caithness in 1159.

‘Wild boars were common in the neighbourhood of London in the time of Henry II., and continued in our kingdom in a wild state till 1577: they were then only to be found in the woods of Lord Latimer, who, we are informed by Dr. Manset, took great delight in their chace.’* The urus, according to Leland,† continued wild in Britain as late as 1466, when six wild bulls were used at the installation feast of George Nevill, archbishop of York, and their descendants still survive in the half-tame Chillingham cattle. Nevertheless, it must be admitted that the allusion to wild cattle (*tauri sylvestres*, &c.) in Britain, in the middle ages, are quite as likely to relate to the runaways from the service of man, as to animals the ancestors of which had never been domesticated.‡ The white bodies and red ears of the Chillingham

* Pennant, ‘Arctic Zoology,’ vol. i. Introduction, part v.

† Coll. vi. p. 2.

‡ In 1866 I adopted the opposite view.—‘Quart. Geol. Journ.’ March 21, 1866, p. 398. New evidence, however, has induced me to modify my opinions, and to doubt the existence of the wild urus in Britain during the middle ages.

cattle agree exactly with the definition of the kind of cattle demanded as compensation by the princes of North and South Wales. 'If the cattle,' Mr. Youatt writes, 'were of a dark or black colour, 150 were to be presented; if white, with red ears, 100.' That is to say, that 100 white oxen of the urus breed were worth 150 of the much smaller *Bos longifrons* type. It is, therefore, highly probable that the Chillingham cattle have not descended from an unbroken line of wild ancestors, but are merely the representatives of a domesticated breed, which, at some time after the Roman occupation, supplanted the small *Bos longifrons*. It is indeed barely possible that a wild animal so bulky as the urus could have held its ground against the attacks of the hunter, during the Roman occupation, in an area so small as Britain.

In this brief outline of the history of the mammalia that inhabited Britain after the post-glacial, and before the historical period, I have confined my attention to Britain only. Their comparison with those of France, Germany, Switzerland, and Italy is well worthy of the naturalists of those countries. The prehistoric group of animals on the Continent will most probably be as sharply and clearly defined from those dwelling in the same area during post-glacial times as they have been shown to be in our island.

Mr. Busk expressed his sense of the value of Mr. Dawkins' paper, which undoubtedly contained a variety of interesting facts, which had been classified with great judgment. He agreed with the author in most of his statements, but thought that he perhaps used the term prehistoric in too vague a sense. Presuming that by it was meant the interval between the Christian or beginning of the Roman period, and the post-glacial epoch, so far as this country was concerned, he would divide that period into two distinct portions. One characterised by the existence of human remains solely with wild animals, and the other by their co-existence also with the remains of domesticated races. Although the author had clearly shown that the majority of our present

domestic animals had been associated with man from a very early period, he did not think that the sheep could lay claim in these countries to anything like the antiquity of the goat, or *Bos longifrons*. There was every reason, on the contrary, to believe that it belonged altogether to a much later period, and probably was never found under circumstances pointing to an epoch more remote than the Roman.

Mr. DAWKINS said that he agreed with Professor Busk in considering that the sheep was introduced into Britain at a later date than the goat, and that therefore its remains characterise a later series of deposits, but nevertheless direct proof on the point was wanting.

ON THE OGHAM MONUMENTS OF THE GAEDHIAL (GAEL).

BY RICHARD ROLT BRASH, Esq., M.R.I.A.

IN the south and south-western counties of Ireland are to be found, in considerable numbers, a class of inscribed monuments, to which the attention of Irish archæologists has been from time to time directed, but with comparatively little result. I shall not here pause to inquire into the causes of this failure, but would simply remark, that the fault does not exist in the monuments, which are numerous and accessible, or in the inscriptions, which are generally legible to the careful investigator, and, as far as they have been deciphered, of very considerable interest. They are found engraved on pillar stones in that archaic character known to Irish philologists as the *Ogham*, properly pronounced *Oum*, and in an ancient dialect of the Gaedhelic (Gaelic).

Distribution.—These monuments are almost exclusively found in the counties of Kerry, Cork, and Waterford, numbering, as far as I have been able to ascertain, one hundred and forty-seven; the rest of Ireland supplies thirteen, of which five are in Kilkenny, one in Limerick, and one in Clare, *all southern counties*; of the remaining five, Kildare furnishes two, Wicklow one, and Roscommon two.

Again, it is worthy of remark, that while twenty-nine Irish counties cannot boast of an Ogham monument, they have been found in England, Wales, and Scotland.

In Devonshire, at Fardel, a stone has been discovered bearing not only a fine and well-preserved Ogham inscription, but also one in Romano-British letters. It is now deposited in the British Museum.

In Wales nine pillar stones have been found, and in Scotland three, bearing Ogham characters. Four of the Welsh monuments exhibit also Romano-British inscriptions, and

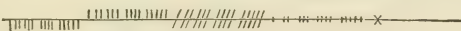
one of them is decidedly bilingual; and another, that found at Lougher in Glamorganshire, was fashioned into the form of a rude Roman altar, most of the ancient Ogham letters having been defaced in the operation.

It is worthy of remark, and an important element in our investigation, that the greater number of these inscribed stones stated to exist in the south and south-west of Ireland, are almost exclusively found along the sea-shore, convenient to harbours or sea estuaries, or not far from the banks of navigable rivers. It is equally worthy of remark, that the Welsh Oghams are also found on the sea-coast counties of Cardigan, Glamorgan, and Pembroke, and one at Brecknock. Thus seven were found in a pagan sepulchre at Ballintaggart on the brow of a hill over the harbour of Dingle, in Kerry; one on the strand at Trabeg; two at Kinard, within half-a-mile of the same strand; one at Enlagh West, one hundred yards from the shore; seven were disintombed from a sand-hill at Smerwick Harbour; one on Dunmore Head, the most western point of Europe. They are found on the shores of Dingle Bay, Tralee Bay, the great estuaries of Kenmare and Bantry, along the coasts of the counties of Cork and Waterford, and inland along the banks of the Bandon, Lee, and Blackwater rivers. In fact, with rare exceptions, none are found outside of a line drawn twenty miles inland, but parallel with the coasts.

The inference from this distribution is necessarily this, that the Ogham character was brought into Ireland by colonists, who landed on her southern shores, spreading themselves along the sea-board from Brandon Head in Kerry to Carnsore Point in Wexford, and who also occupied for a time the opposite coasts of Wales and Cornwall, the topography of which districts, as well as parts of Devon, are 'redolent' of the Gaedhal (Gael). The Triads and other ancient Welsh authorities allude to the lengthened occupation of South Wales and Anglesey by the 'Gwyddel,' and their ultimate expulsion by the Cymry. The Rev. W. Basil Jones, in his interesting work the 'Gael in Gwynedd,' has collected a large amount of documentary and topographical evidence on this head; indeed, the great number of Gaedhelic (Gaelic) names

of rivers, hills, valleys, and other natural features in Wales and Cornwall, and the admixture of Gaedhelic words with the Cymric, a totally different language, can only be accounted for by a lengthened Gaedhelic occupation of these districts.

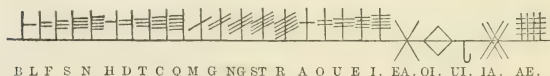
The Ogham Character.—The Ogham letters, as found on Megalithic monuments, are formed by certain combinations of a simple short line, placed in reference to one continuous line, called the fleasg, or stem line; these combinations range from one to five, and their values depend upon their being placed above, across, or below the stem line; there are five consonants above, five consonants below, and five consonants across the line, two of which, NG and ST, are double, and scarcely ever used. The vowels are represented by oval dots, or very short lines across the stem line; in a very few instances the vowels are represented by longer strokes, at right angles to the stem line, in which cases the crossing consonants are always oblique, to distinguish them from the vowels; but these instances are very rare. There is another character found on these pillar stones, namely two strokes forming a St. Andrew's cross on the stem line \times . On the authority of the Book of Balymote, this is supposed to represent the diphthong EA. It is not frequently used, and the value ascribed to it is open to doubt. In fact the characters in general use on the monuments are eighteen in number, the other three, even when used, performing no function of importance, that I could ascertain. The Ogham alphabet, as taken from actual graven inscriptions, will therefore stand as follows:—



 B L F S N H D T C Q M G N G S T R A O U E I E A

The word Ogham is found in various Irish dictionaries; MacCurtin calls 'Ogam the occult manner of writing in use among the ancient Gaedhal.' O'Brien gives the same definition, as does also O'Reilly. The word is variously spelled Ogam, Ogham, Oghuim, and is properly pronounced Oum. There is a short treatise on this manner of writing, in a tract called 'Uraccept nan-Eiges,' or 'the Primer of the Bards;' and which is contained in the Book of Ballymote, a vellum

MS., now in the library of the Royal Irish Academy. It states that it derives its name from its inventor Ogma, the son of Elathan, a chieftain of that mythic race called Tuath-de-Danans, who occupy so prominent a place in the traditions and poetry of the bards; that the object of its invention was 'that the learned might have a language unknown to the vulgar.' I am not much inclined to attach great importance to this treatise. I am of opinion that the mediæval scribe who compiled it knew very little more about the Ogham than we do at present, and that its origin was in his time no more than a tradition. The name may with more probability be derived from the word 'Ogan, a bough, twig, branch,'* as this alphabet is more generally known by the name of the 'Ogham Craobh,' or tree Ogham, from its resemblance to that production of nature; the centre line representing the trunk, and the letters like branches springing from each side in the manner here represented, and which is believed to have been the original form in which the character was invented.



In this scale are given five diphthongs; it is evident, however, that the characters denoting these have no affinity to the rest of this archaic alphabet, and must have been an addition of some mediæval scribes, as is indeed very plainly hinted at by the author of the 'Primer of the Bards.' That they did not belong to the original scale is evident from the significant fact that, with the exception already alluded to, none of them have been found in Irish monuments.

The learned Gaelic antiquary, Roderic O'Flaherty, is of opinion that the original alphabet consisted of eighteen simple characters, rejecting all the diphthongs and the two double consonants, thus assimilating in number with the ancient Greek alphabet according to Pliny from Aristotle.†

* O'Reilly's Dictionary.

† Pliny, 'Nat. Hist.' b. vii. c. 57. See also Ogygia, pt. iii. c. 30. A similar

Dr. O'Connor, who gave close attention to the subject of our early letters, is of opinion that the original alphabet consisted of sixteen letters. Now, while with the above-named writers there may have been a lurking desire or sentiment to assimilate our early alphabet in point of numbers to the Cadmean and early Greek ones, it cannot be denied that an examination of the lapidary inscriptions remaining to us, and which after all are the only reliable evidence, will lead us to take their view of the subject.

I have before stated that this character is called the Ogham Craobh, the tree or branch Ogham: its arboretic origin is further confirmed by the important fact, that all the letters are called after trees or shrubs, in the following order:

B	Beith	the	<i>Birch</i>	ST	Straif	the	<i>Blackthorn</i>
L	Luis		<i>Quicken</i>	R	Ruis		<i>Elder</i>
F	Fearu		<i>Alder</i>	A	Ailm		<i>Fir</i>
S	Sail		<i>Sallow</i>	O	Onn		<i>Gorse</i>
N	Nin		<i>Ash</i>	U	Ur		<i>Heath</i>
H	Huath		<i>Hawthorn</i>	E	Eadad		<i>Aspen</i>
D	Duir		<i>Oak</i>	I	Idad		<i>Yew</i>
T	Tinne		<i>Hazel</i>	EA	Eabad		<i>Aspen</i>
Q	Queirt		<i>Apple</i>	OI	Oir		<i>Spindle-tree</i>
M	Muin		<i>Vine</i>	UI	Uilleaun		<i>Woodbine</i>
G	Gort		<i>Ivy</i>	IA	Ifin		<i>Gooseberry.</i>
NG	Ngedal		<i>Broom</i>				

Amhancoll, that is, two c's or colls, because the character is represented by two sets of four strokes crossing each other at right angles.

This alphabet is also called Beth, Luis, Nin. From the sequence of the letters, its form has given rise to the idea that the ancient arrangement was B L N, and not as at present B L F. The question is difficult to determine. The medial or stem line is called the 'Fleasg,' which signifies a rod, or wand, and the letters are called 'Feadha,' i.e. woods, trees.

An inspection of the Ogham scale shows us the regular division of the same into groups of five letters, none exceeding that number. Each of these has its distinguishing name: thus, the first group B L F S N is called the B group (*aicme, b*); H D T C Q, the H group (*aicme, h*); and so on with the rest; the diphthongs are called the *foraicme*.

opinion has been expressed by Charles O'Connor, 'Dissert. Hist. Ireland,' edit. 1766, p. 36.

The Material of the Monuments.—Our acquaintance with the Ogham is almost exclusively of a monumental character; the majority of the inscriptions being on pillar stones *in situ*, and, when found in other positions, giving evidence of their having been removed from their original localities and uses. The stones are, with a very few exceptions, rude undressed monoliths, from four feet to fifteen feet in height, selected with evident care from the hardest beds of that dull, yellowish clay slate, or of the old red sandstone, so plentifully distributed through the counties of Cork, Kerry, and Waterford; the former being the favourite material, justifying the selection of the engravers, as the inscriptions on it are by far the best preserved.

The straightest angle of the stone was usually selected, and this forming the fleasg, or stem-line, the legend was engraved thereon, commencing invariably towards the bottom of the stone, and running upwards to the top, or from left to right. Where the one angle is insufficient, the inscription runs round the head, if it is suitable for the purpose; if not, it is taken up on the opposite angle of the same face. Where there is a single inscription, or a double one, it invariably commences on a left hand angle of the monument. At Ardmore, county of Waterford, is one having an inscription on three angles. In a few instances the legend is engraved on the face of the stone, as the celebrated one at Mount Callan, county of Clare, and at Kilcolman, county of Kerry; while a singular monument at Kilbolane, in the same county, combines in itself all the various forms in which the Ogham is found, having two inscriptions on its angles, one on the face of the stone, having an incised stem-line, and another parallel to the last, without a stem-line.

The Sites of the Monuments.—Numbers of them are found singly, standing in the open field, in deep glens, on the side of the mountain, and on the lonely moorland, and some on headlands overhanging the sea, as at Dunmore and Brandon Heads in Kerry, and Hook Point in Waterford.

Considerable numbers have been found in Cilleens. This name designates a class of rude circular inclosures that are

found in great numbers all over the country, and which are devoted to the interment of unbaptized infants and suicides from time immemorial, and which are looked upon with great reverence and superstition by the peasantry; being unconsecrated, no baptized person is interred therein.

They are usually circular areas, slightly raised above the surrounding level, and inclosed by a low fence of earth, or of earth and stones, in some instances by a wall of rude uncemented masonry, or by one or more circles of rude pillar-stones, as at Killacloyne and Mitchel's Town, county of Cork, and Kippock, county of Kerry. The entrance is generally a cut made through the fence, having a tall pillar-stone at either side. The Cilleen is always distinguished from the Rath by having only one rampart and no foss, the Rath having always a foss to each rampart. Cist-formed graves are found in the Cilleen, and sometimes artificial crypts; low oblong mounds with a rude stone at each end generally mark a human interment. The term Cilleen appears to be derived from 'ceal,' an Irish word which signifies 'a concealment, concealing;' also 'death and everything terrible;* and has been from the remotest times applied to designate a graveyard, whether pagan or Christian. Eventually it also became a designation for the church, from the constant use of the word cill, or ceall, applied towards its site. The term is not an ecclesiastical one, neither is it derived, as some have supposed, from the Latin *cella*; a mere similarity of sound is the weakest evidence of a common derivation. The Roman missionaries imported into Ireland the terms *ecclesia* and *temple*, but the word cill or ceal is exclusively confined in its use to the Gaedhal, or to those countries which came under their influence. In the Isle of Man, Wales, Cornwall, and Scotland, the cills are almost as plentiful as in Ireland, because these places were colonised by the pagan Gaedhal.

In England it is not the case. We have scarcely an example of the use of the word with the exception of Kilpeck, although that country was Christianised by Roman

* O'Reilly's Dictionary.

and Irish missionaries. We know that Whitby, Gillingham, Glastonbury, Lindisfarne, and many other important ecclesiastical centres, were either founded or nurtured by the latter, yet in these localities we have no traces of the word *cill* as applied to a place of worship. The most important evidence, however, is the fact that, scattered over the face of Ireland, are several thousand of these unconsecrated pagan cemeteries called *Cilleens*, which have no traces of churches in connection with them, either in memory or tradition.

Names of an unmistakably pagan type are also applied to them, as, for instance, one situated in the barony of Condons and county of Cork is called *Cill-na-Druath*—the grave or cemetery of the Druid. I have been thus particular on this point as it is important, in estimating the age of the Ogham, to show that these sites, where so many of them have been found, have had no connection with Christianity, and were originally the pagan cemeteries of the early inhabitants of our island. The following *Cilleens* have supplied us with Ogham-inscribed pillar-stones:—Ballintaggart, seven; Ballinrannig, seven; Lugnagappul, two; Kilcolaght, six; Gortamaccaree, one; Drumcoar, one; Keelcolman, one; Kippoch, one: these are all in Kerry. Kilbereherth, Keelboultragh, Killacloyne, Shanacloon, Cooleroen, Aghabullog, supply us also with similar monuments. The crypt connected with the *Cilleen* of Drumlohan, county of Waterford, has nine inscribed stones used up in its construction.

Oghams found in Rathes.—Ireland is remarkable for a class of earthwork constructions scattered broadcast over the country. They are usually circular, but occasionally square and rectangular, of all dimensions, from twenty to one hundred and fifty feet diameter, and having from one to three earthen ramparts, with corresponding fosses. They are found in all situations, both on hills and in valleys, and are numerous in the open plains. Where stone is plentiful, they are sometimes constructed of uncemented masonry, and are then denominated *Caher*, and sometimes *Cashel*. When constructed of earth, they are indifferently called *rath*, *lios*, or *fort*. Underground chambers are usually found in these Rathes, some circular, some oval, and others

in the form of rectangular galleries. They are usually constructed of dry rubble masonry, and lintelled over with large slabs of stone; sometimes these lintels are supported at the ends by upright pillars. It is true we cannot determine at what period the Gaedhal ceased to erect Rathes, but this we are assured of, that their erection commenced with the earliest inhabitants.

Now it is a remarkable fact that the best preserved of our Ogham inscriptions have been found used as building material in the construction of the underground chambers of Rathes; sometimes used as upright pillars, but more generally as roofing slabs or lintels, and placed in such positions generally that the inscriptions are unreadable or concealed, requiring the uncovering of the crypt in order to a proper examination.

The inevitable inference from this fact is, that, at the remote period when these were constructed, the inscribed monumental pillars were removed from their original sites and uses, and being suitable building material, were used in the construction of these chambers, the builders having no veneration or respect for them. It is therefore evident that, at whatever period these Rathes were constructed, the age of the inscribed pillars was long anterior to them. The county of Kerry supplies us with the following list of Rathes that have contributed to our list of Oghams:—Dunloe, six; Aghacarrible, three; Corkaboy, one; Lougher, one; Brackloon, one; Tinnahaly, two; Gortnacurrane, two. In the county of Cork: Aghalusky, three; Burnfort, one; Glenawillen, two; Ballyhank, five; Roovesmore, three; Cooldorrihy, one. In the county of Waterford: Drumlohan, nine; Rath-Coolnamuck, one. In Roscommon: the Religna-Righ, two. It is an important and significant fact that, in almost every instance where Ogham inscriptions are found in a Rath cave, a Cilleen, or the site of a Cilleen, will be found in the neighbourhood; the inference being that the primitive burial-ground was despoiled of its monumental stones by the Rath builders.

Christian Graveyards.—In a few instances Oghams have been found in Christian graveyards, as at Aglish, Kinnard,

Kilmalcheder, and Kilbonane, county of Kerry, at Aghabullog, county of Cork, and at Kilrush and Ardmore, county of Waterford, the entire number so discovered being eleven.

Christian Churches.—The builders of our early churches seem not to have regarded these inscriptions with any sentiment of respect or reverence. Ardmore, in the county of Waterford, is stated to have been founded by the holy Saint Declan, one of the precursors of St. Patrick. There exists here at present a remarkable group of ecclesiastical buildings. First, a round tower of remarkable workmanship and symmetry, being built of small blocks of ashlar, closely and beautifully jointed in regular courses, and having its original stone conical spirelet. Secondly, the Leabha, or bed of St. Declan, a cell of small dimensions, being not more than ten feet by eight feet in the clear of walls, and constructed after the fashion of those primitive cells described by Dr. Petrie in his well-known work, and which is regarded by the peasantry with the most superstitious veneration, the very earth from the interior being scooped out and carried away under an impression of its curative powers. Thirdly, a church of Romanesque type, having a portion of the walls of a still more ancient church, with masonry of a polygonal character incorporated with it.

Some years since a stone, having an inscription on three of its angles, was found built into the east gable of St. Declan's cell; one of the inscriptions, and portions of the other two, were concealed, until the stone was taken out of its place. This structure is believed to have been the original cell of St. Declan, erected in the fifth century, and there are no reasonable grounds for doubting the statement.

Not long since, Mr. George V. du Noyer discovered a number of Oghams used up in the construction of the church of Seskinan in the county of Waterford.

Mr. William Hill, architect, of Cork, when removing the ancient church of St. Olan's at Aghabullog in the same county, about thirty years since, discovered an Ogham monument built into the wall of the church, which was of great antiquity. This stone is now in the museum of the Royal Cork Institution.

Miscellaneous Sites.—At the house of a small farmer named Griffin, at Ballynesteenig, two and a half miles east of Dingle, I saw a remarkably fine monument, with a well-preserved inscription, but unfortunately broken in two, one half was built into the angle of a fence, the other supported a turf-rick.

One now in the Royal Cork Institution once fulfilled the important functions of a lintel over the door of a pigstye. One in the Royal Irish Academy performed a similar office over the door of a peasant's cabin; and another did duty as the mantel-tree of his hearth; and one of the finest I have seen, that now exhibited in No. 2 drawing, was used as a foot-bridge over the Dallaheena river in the county of Cork.

In all about 160 inscribed stones have been discovered—a considerable number, if we take into account the accidents to which they have been exposed; used up as building materials in churches, cottages, and out-offices; built into field-fences, and broken up for road material; and broken up by the farmers because, as one of them acknowledged to me, they were in his way.

The Nature of the Inscriptions.—The character and intent of the inscriptions upon Ogham monuments remained for many years a *vexata quæstio* to Irish archæologists, and from time to time the most absurd renderings of individual inscriptions appeared so absurd as to throw ridicule upon the whole pursuit. While it must be admitted that many of the inscriptions are impossible of translation, it is equally a fact that very many others, from their extreme brevity and simplicity, can be easily understood, the failure of many attempted renderings resulting from one or other of the following causes:—

Firstly. An ignorance of the due nature and intent of the monuments.

Secondly. The linguistic difficulties presented by the obsolete Gaedhelic (Gaelic) in which they are inscribed.

Thirdly. Ignorance of the contractions used in engraving on a material where brevity was essential.

Fourthly. Imperfection of copies, as well as of the inscriptions themselves, from weather, wear, and other injuries.

Fifthly. The preconceived ideas or prejudices of the translators leading them to imagine what the inscriptions ought to be, and thence torturing, misplacing, and misreading the characters in every possible way in order to bring out allusions to some local historic fact, or to the name of some famous mythic chief, king, or Druid, or some deity supposed to have been worshipped in pagan times.

Rejecting such illusory modes of investigation, and taking up the key-alphabet from the book of Ballymote, as adopted by the Right Rev. Dr. Graves, and with its assistance comparing and carefully analysing a number of these inscriptions, the candid and patient investigator will, I think, be led to the following conclusions:—

Firstly. That the monuments are almost exclusively sepulchral or commemorative.

Secondly. That they are inscribed in the simplest and briefest manner, connecting words scarcely ever used, and words frequently expressed by initials.

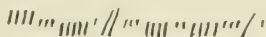
Thirdly. That the word ‘Maqi,’ the genitive case of Mac, the Gaedhelic for son, occurs on the majority of the monuments in some or other of its forms, and that where it thus occurs it becomes the keyword of the inscription, as before and after it we are sure to find a proper name; and that the position of this word dictates the position in which it should be read.

The simplest form of inscription is that of a simple name, as on the pillar-stone at Ardovenagh, county Kerry, which gives ‘Coftet,’ or a pillar-stone in the possession of the late Mr. John Windele as follows—‘Uleaghu.’ It is a remarkable and suggestive fact that this name is found in debased Roman letters on a pillar-stone in Wales.*

On the following we have the addition of the profession of the individual—‘Artagni,’ that is, ‘Artag, a warrior.’ The word ‘ni’ signifies a hero, a warrior. The monument from which this inscription is taken is shown on drawing No. 1, and stands in the precincts of a remarkable earthwork called Bealamire, county Cork. This stone is eight feet six inches above ground, and five feet in width.

* *Archæological Journal*, vol. 1845, p. 77.

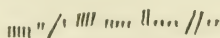
A monument from Glounagloch, originally taken from a stone circle, and now in the Royal Cork Institution, has the following :—


 C U N A G U S O S U M A

‘Cunagus os uma,’ *i.e.* ‘Cunagus on this grave;’ *os*, prep. on, upon; *uma*, ‘a grave.’*

The prefix ‘cu’ will be found on many of these monuments; it signifies a hound, also a hero, a champion, and is very usual in early Gaelic names, as Cu-Chullin, Cu-Duileg, Cu-Mara, Cu-Sinna, Cu-Santin.

The next form of inscription is that in which the name of the deceased and the patronymic is given, as on the stone at St. Olan’s well, where we have

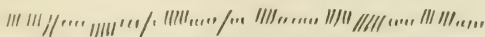

 N O M A Q I D E G O

‘No, the son of Dego.’

This stone stands eight feet six inches above ground. It was originally taken out of the crypt of an erased fort or Rath, and was for many years used as a footbridge across the Dallaheena river, in the parish of Aghabullog, fourteen miles from Cork, where it was seen by the late Mr. John Windele, through whose exertions it was removed and erected in its present position (Plate, No. 2).

The name Dego has been found on several of these monuments, as at Drumlohan, county Waterford, and Dunlo, county Kerry.

The drawing No. 3 represents a fine inscribed monolith at Greenhill, within fourteen miles of Cork. It stands on the hill-side, in a field, and has on it the following inscription :—


 T T G E N U M A Q I M U C O I Q R I T T I

* O'Reilly's Dictionary.

It reads—

Dgenu, the son of the swineherd, Curitti.

In Gaelic a double τ at the commencement of a word has the power of d . This name Dgenu has not died out. I met it in Dublin not long since, under the form of Chenu, which in pronunciation is exactly the same. The last name, Ritti, I have met with on many Ogham monuments in various forms, as Ret, Rete, Rettos.

On some monuments words of grief and regret are added, as on the celebrated stone at 'Trabeg,' or the 'little strand,' one mile east of Dingle, county of Kerry. This remarkable monument, which lies prostrate, just at high-water mark, is eight feet in length, and about two feet by ten inches in centre. The inscription is engraven in bold, deep characters on one angle, and on the face of the stone some zealous Christian has inscribed a cross, a custom persistently followed with respect to pagan monuments in Ireland as well as elsewhere.

This monument, strange to say, was first noticed by the celebrated Welsh antiquary Llhyd, in the year 1707. He gave a rude and incorrect copy of the inscription, but he had not the remotest idea of its nature. His copy, however, which was published in the 'Philosophical Transactions,' vol. xxvii., is quite sufficient to enable us to identify the monument. It was subsequently noticed by Mr. Pelham and by the late Mr. John Windele, the celebrated Oghamist. I examined the stone myself on July 26, 1868, and made a drawing of it. The inscription is as follows:—

B R U S C C O S M A Q Q I C A L U O C O

'Brusccos Maqqi Calu oc o,' i.e. 'Bruscos, the son of Calu: alas! alas!'

All the characters are deeply engraven and perfectly legible. The stone lies solitary on the strand; there is no graveyard or church near it; and the rising tide washes over

it. It is a shame to the lord of the soil that this noble monument is allowed to lie in this neglected state.*

In some instances the manner of death is commemorated on the monuments, as in the following inscription, copied by myself from the cave at Drumlohan:—


 B I R M A Q I M U C O I R O T T A I S

‘Bir Maqi Mucoi rottais,’ *i. e.* ‘Bir, the son of Mucoi (in) red death;’ *Rott*, a red; *Aise*, s.f. death.†

In some cases the name of the deceased is not given, but simply he is described as the son of so-and-so. Thus, on one of the Roovesmore monuments discovered by Colonel A. Lane Fox, and deposited by that gentleman in the British Museum, we have two individuals commemorated in this manner on the same stone, one on each front angle—


The son of Falam, a warrior;
The son of Erei here.

The above examples will give a fair idea of the nature of the inscriptions. The renderings are my own, and are given subject to correction. In dealing with them I have not added, deducted, or transposed a single letter or score, but have taken them exactly as I found them. In truth, I have seldom found any difficulty in reading an inscription when perfect; the difficulty arises when the characters are injured by violence or weather-wear.

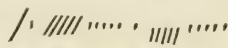
I am of opinion that this character was used for other purposes than that of sepulchral monuments: some stones remain to us that appear to have been used for termini or boundary-stones. Thus on a solitary pillar, five feet high, three and a half feet wide, and two and a half feet thick, standing in an open field at Kilgobinet, seven miles west from Castlemaine in Kerry, we have the following:—

* It is a curious coincidence, that a Roman inscription has been found at Lincoln to ‘Nominus Sacer, the son of *Bruscus*, of the tribe of the Senones in Gaul.’—Wright’s ‘Celt, Roman, and Saxon,’ p. 253; Arch. Journ. xvii. p. 15.

† O’Reilly’s Dictionary.


 D U G O N N G U N S

‘Du Gonngu,’ *i.e.* ‘Gonuggus Land;’ ‘Gongu’ a proper name. This doubling of consonants is very usual in Gaelic names. *Du*, s. m. a land, country, habitation, village, a place.* We have another instance in a monument now standing in the graveyard of Kinard, two miles east of Dingle in Kerry, and on which is the following inscription:—


 M A R I A N I

The stone is four feet six inches in length, and of a flattish oval in section; the inscription runs upward, and the stem-line is understood, not being marked. On the same face and at the right-hand side is inscribed a square diagram of nine inches on each side: this is subdivided by right lines into four equal squares, the two upper ones of which are again subdivided into four smaller squares.

The late Mr. John Windele, an eminent authority on Ogham, translated this—‘Magh Riani,’ *i.e.* ‘the field of Riani, Rian, or Ruan.’ This translation is simple and unconstrained. The name Rian, or Ruan, is a well-known Gaelic one, and of considerable antiquity; and is perpetuated in the name of a townland—‘*Tir-Ruan*,’ *i.e.* ‘the land of Ruan’ (the very same import as the above)—in the parish of Bally-Ferriter, about ten miles from Kinard.

The name will be found in the ‘Annals of the Four Masters,’ in the ‘Book of Rights,’ published by the Irish Celtic Society, and in Keating’s ‘History of Ireland.’ Strange, also, the name is found in that part of Cornwall where the topography is intensely Gaedhelic, giving a designation to three parishes—Ruan Major and Ruan Minor, also to Ruan Langihorne; and, stranger still, a pillar-stone, standing about four miles from East Michael, commemorates in debased Roman letters an individual of the same name:—

RVANI HIC IACET.

* O'Reilly's Dictionary.

The diagram which accompanies the Kinard inscription representing a square ground-plot subdivided, lends strong countenance to the presumption of this being a terminus or landmark.

The Age of the Ogham.—It may be expected from me that I should offer some conjecture as to the probable age of this mode of writing. This, I honestly acknowledge, I am unable to do, even approximately. I do not think that our knowledge of the subject has arrived at that stage that would authorise any dogmatic assertions on the question. I am however decided in one view, and it is this, that the Ogham was introduced into Ireland long anterior to Christianity, by a powerful colony who landed on the south-west coast, who spread themselves along the southern and round the eastern shores, who ultimately conquered or settled the whole island, imposing their language upon the aborigines, if such preceded them. I believe that the Ogham was used for all the purposes of a written character, and consequently upon other material than stone, as is stated by those learned Gaelic antiquaries, Roderick O'Flaherty, Duaid Mac Firbis, and the late Dr. O'Curry—even upon birch-bark leaves and waxed tablets; that it was superseded by the ornate letters now in use, and which were also adopted by the Gaedhal before their conversion to Christianity, as the letters brought by St. Patrick were the Roman alphabet, both in form and arrangement, while the letters of the Gaedhal followed, as they do still, the arrangement of the more archaic Ogham, B L F S N.

The limits I have assigned to the present paper will not allow me to enlarge on this topic. I will, however, state some reasons in support of the pre-Christian antiquity of the Ogham:—

Firstly. The archaic simplicity of the character, being such as would be invented by a people emerging from a state of barbarism, having a capacity for being engraven without any difficulty, upon any material, and with any implements.

Secondly. The brevity and simplicity of the inscriptions being of the same character as the early Greek and Asiatic ones.

Thirdly. The absence of all allusion to that mode of writing in our historic MSS. and annals.

Fourthly. That in the ancient historic tales and romances preserved in Gaedhelic MSS., all the allusions to the Ogham refer them to pagan times, usages, and ceremonies.

Fifthly. That none of the pious formulæ usual on ancient Irish Christian monuments are found on the Ogham—such as *Oroit*, *Bendacht*, &c.—and that no allusion to any Christian doctrine, usage, or divine personage has been found on any such.

Sixthly. That though rude crosses have been inscribed on a few stones now in graveyards, yet that no cross has been found on any stone taken out of a Rath cave, such rude crosses having been inscribed for the purpose of Christianising a monument looked upon as pagan.

Conclusion.—I have thus endeavoured in a brief manner to lay before the Congress a description of a class of monuments peculiar to the British isles, and which, though as far as we know of them, they do not seem likely to add much to our knowledge of the early history of the primitive populations, yet are they of great interest to the philologist and the antiquary, indicating the fact that a system of primitive letters was introduced into Ireland at a prehistoric period by an invading or colonising people.

Now, among the many migrations recorded by our Bardic historians, there is one, and only one, to whom the introduction of the Ogham might be attributed with any degree of plausibility—namely, that tribe called the *Clanna Miledh*, or *Scoti*.

Rejecting the mythic origin and adventures of the ancestors of *Miledh*, and the conjectural chronology of the Bards, we may safely admit the probability of an ancient eastern tribe having migrated through or from the northern parts of Europe, along the shores of the Mediterranean to Ceuta, and from thence across the straits into Spain; the very identical route taken by another Eastern tribe in subsequent ages, who founded an Oriental empire in Europe that lasted nearly eight centuries. *Tarik* and his Arabs did, in A.D. 710, what their ancestors accomplished perhaps fifteen

centuries before, for ‘history but repeats itself.’ The Phœnicians founded Gades eleven or twelve centuries B.C. These traders never founded colonies in uninhabited districts; they were merchants and chapmen, and without a population they could not trade. At all events, during the dominion of Carthage, and in the days of the Scipios, Spain was not only colonised by the Phœnicians, but was inhabited by a numerous, wealthy, and prosperous aboriginal population.

That Spain may in these days have thrown off some of her adventurous or superabundant population is not at all unlikely. That one of these bands may have dropped on the southern shores of Ireland is equally probable; because any person looking at the map of Europe cannot fail to see that the south of Ireland is the natural land-fall from the north of Spain.

Whether such a migration as we have been considering took place before or after the intercourse of the Tyrian people with the British Isles, it is now impossible to say: more likely it took place subsequently, as we must believe that enterprising people to have been the pioneers of all maritime discovery. All our native historians, however they may differ on other points, unanimously insist on this Spanish invasion, and the entire subjugation of Ireland by the invaders; and here I would remark that this statement is corroborated by the opinions of many learned men having no Celtic sympathies or prejudices whatsoever. The scope of the present paper will not permit me to recapitulate these opinions.

Our native authorities go on to state that these invaders came in a fleet of thirty ships; that in each were thirty warriors with their wives; that they landed at Inbher Sceine, now the Bay of Kenmare, in the county of Kerry; that from thence they marched inland, and encountered an army of the natives, stated then to be a people called Tuath de Dannans, at Sliabh Mis (a mountain district between the bays of Tralee and Dingle); that a battle was there fought, in which the latter were defeated. This engagement appears to have been a running fight, as was usual in that period amongst semi-civilised tribes, continued through a series of

glens, or valleys, at the foot of Sliabh Mis ; two of these are called Glen-Fais and Glen-Scothian, from Fais and Scota, two Amazons, who fought in the ranks of the Clanna-Miledh, and were there slain. These localities are as popularly known by the above names as any others in the country ; and in Glen-Fais there are certainly evidences of some remarkable transactions having there taken place at some remote period.

Here are two enormous pillar-stones, one eleven feet in height, still erect ; the other is ten feet in height, in an inclining position, the latter having a fine Ogham inscription engraved thereon. There is also an unascertained number of ancient graves, cist-formed, containing human remains ; the discovery and opening of several of which are described in a paper read before the Royal Irish Academy by the late Venerable Archdeacon Rowan, on November 8, 1858.

Again, it is a strong corroborative fact, that in the very county in which the Gaedhal are said to have first landed are found by far the greatest proportion of Ogham monuments ; that they are found on the reputed scene of their first battle, and in very remarkable numbers in and about the very localities where they made their first appearance and sojourn. The advent of the Spanish colonists was no doubt an epoch in the primitive history of Ireland to them. I believe she is indebted for her Brehon laws, her poetry, her music, and that system of Oriental paganism of which so many relics remain to us.

It may be very naturally asked, Have we any evidence of the existence of such a people in Spain ? or is there any historic evidence of the state of that country, or of the people inhabiting it, at the remote period claimed for the Gaedhelic invasion ? I think that Strabo provides an answer to so natural a query in his description of the Turdetani and Turduli—a people or peoples inhabiting southern Spain. Hear what he says of them :—‘ These people are esteemed to be the most intelligent of all the Iberians ; they have an alphabet, and possess ancient writings, poems, and metrical laws, six thousand years old, as they say. The other Iberians are likewise furnished with an alphabet, although not of the

same form, nor do they speak the same language.’* He further states that the people called themselves Turdetani, and their country Turdetania. This word is pure Gaedhelic, *Tir-de-Tana*, from *Tir*, a country, land; *de*, of; *Tana*, a drove, a herd, ‘the land of herds.’ The Greek geographer states, ‘that Turditania bred a superabundance of cattle,† and that they were famous for the production and export of wool, and that rams for the purpose of covering fetched a talent.’‡ He further states that they were also called *Turduli*; but whether they were two distinct tribes, or one tribe having two appellations, he could not exactly say. Now, *Tirduli* is as intensely Gaedhelic as any word can be; *Tir-duile*, from *Tir*, a country, land (in the Sanscrit, *Tir* means land-border), and *Duile*, a pleasant land or country. How indicative both these names are of the beautiful and fertile Andalusia, the richest province of southern Spain, originally inhabited by those people. I am well aware how delusive etymological likenesses are, and how apt to lead us astray in investigation, nor do I usually attach much importance to them; but in this instance, where, without doing any violence to the structure of words, we find one language interpreting another so aptly, according to the very physical features and productions of a country, we are bound to attach some value to them, were it only as corroborative evidence.

The topography of southern Spain is intensely Gaedhelic. Many of its rivers, streams, lakes, hills, and other physical features are called by names which can only be interpreted by that language; while the peasantry themselves, in their character, customs, and superstitions, are a similar race to our own. In addition: there is corroborative evidence in the strong sympathies existing, from time immemorial, between the people of the south and west of Ireland and the Spaniards, in the constant intercourse from the most ancient times continued down to late medieval times; and in the ethnological affinities between the people of various parts of the west and south-west coast of Ireland and those of Spain; not of the

* Strabo, Bohn's edit. p. 209.

† Ibid. p. 217.

‡ Ibid. p. 216.

Biscayans or Catalans, who were of the Gothic race, but of the Andalusians, who were of the Eastern type.

That considerable numbers of Ogham inscriptions still remain undiscovered is very probable; not one per cent. of our Rathes have been explored, and these have proved the great mines of our Ogham wealth. That many also exist in Wales, Cornwall, and Devon, particularly on the coast-lines, is equally probable. I would strongly advise the antiquaries of England and Wales to keep a sharp look-out for such in their explorations, and to examine every standing stone they meet with in these districts for Ogham letters.* I think it also probable that such may be found on the west and north-west coasts of France, particularly that district formerly inhabited by the Veneti, a powerful maritime people, whose fleets fought the Romans, and for some time with success, and who were all but exterminated. Who were these Veneti who left such wonderful megalithic monuments after them as we find at Carnac, Lochmariaker, and Erdevan? How came so powerful a naval colony in this remote district? Could they have been a Phœnician migration fleeing from the Roman yoke in Spain or Africa, bringing with them to this remote spot in north-west Gaul their love of the sea and maritime adventure? Driven forth again by the Roman lust of dominion, may they not have sought a new home in the western island, so convenient a landfall from Cape Finis-terre? May they not have been the Fenii of Irish history and tradition; and, if so, would they not realise the mythic migrations of the Scoti from the East, through Africa and Spain to Erin? These are speculations, but in my opinion suggestive ones. Future discoveries may throw more light upon a subject no doubt beset with difficulties.

Mr. P. O'CALLAGHAN said it would be very interesting to know whether the Ogham characters were known to exist anywhere in Spain, or indeed anywhere out of the British islands?

* See *Archæological Journal*, vol. xviii. p. 176; *Archæologia Cambrensis*, third series, vol. vi. p. 128; vol. vii. p. 43; vol. viii. p. 52; and vol. ix. p. 262; also *Proceedings Soc. Ant. London*, second series, vol. iii. p. 146.

Professor HARKNESS said the writing on the Ogham monuments was as rude as could be conceived. They were principally confined to the counties of Cork, Waterford, and Clare. He could not conceive that a race could have settled there among a rude people who possessed no knowledge of writing without spreading that knowledge among the people about them. If there had been any Ogham scholars here from Ireland, there would have been a great controversy respecting the meaning that Mr. Brash had given to some of the inscriptions. Every such scholar in Ireland thinks that he alone knows anything about the subject; and, had there been any of these gentlemen here, there would have been a regular Irish shindy. He thought that every Ogham inscription indicated that the characters were of comparatively recent times. If they belonged to the high antiquity assigned them in the paper, he thought the inscriptions would have been much more worn. He considered, for certain reasons which he enumerated, that the Ogham characters were the runic characters of the Dane.

Colonel A. LANE FOX said that he could vouch for the accuracy of some of Mr. Brash's descriptions of Oghams in the county of Kerry, for having preceded him in the examination of several of these inscriptions, he had since had an opportunity of comparing his own rubbings with those of Mr. Brash, and had found them to agree to the letter. This should be sufficient to convince those who doubted whether Ogham was a written character at all, that the scale to which Mr. Brash had referred was capable of precise application in deciphering these inscriptions. As regards the genuineness of that scale, being unacquainted with the Irish language, he could not himself speak from personal knowledge. He thought, however, the researches of the learned Bishop of Limerick on this subject were entitled to weight, and that there could be little doubt as to the value of the letters; in fact, any one who would take the trouble to examine a number of these inscriptions would find that the word 'Maqi,' 'son of'—as the author of the paper had said—was almost invariably a key to the reading of the

inscription, and was nearly always preceded and followed by a name. The fact that Latin inscriptions had on several occasions been found in the Ogham characters was in itself a proof that it had been in use during the historic age, but it afforded no clue to the origin of this mode of writing. There were, however, some peculiarities in the Ogham scale itself which appeared to him to tell their own story. It was an arbitrary scale, devised at one time, and one idea pervaded the whole alphabet from beginning to end. It consisted of groups of marks arranged throughout from one to five on each side and across a central stem; it presented no features of natural growth, and the letters were totally dissimilar in character from those which in most European and other alphabets, had grown out of a previous system of hieroglyphics and picture-writing. The vowels, moreover, were arranged in a group by themselves, and separated from the consonants, and this could only be done by a people who had some grammatical knowledge, and who had made some advance in literature. On the other hand, the marks themselves were of the most primitive kind that it was possible to conceive. He thought, therefore, that we might distinguish a double element in this Ogham scale, a civilised and a savage element; and he accounted for this by supposing it to be the work of a civilised people possessing an alphabet and a literature of their own, adapted to the comprehension of an uncivilised people by means of a rude system of scoring, such as it is usual to find among races in a low state of culture. He was confirmed in this opinion by observing the great resemblance in character between the scorings denoting the owner's marks upon the arrows of the Esquimaux and other savages to Ogham. The Esquimaux mark their arrows by means of incised lines across a longitudinal stem-line, and, as in Ogham, the corner edge of the shaft is often used in place of a longitudinal stem. Some of these marks might actually be referred to the Ogham scale. He did not mean to infer from this that there was any connection between them beyond a general resemblance in method and design. In the Nydam Moss in Denmark, arrows had been discovered with marks on them so similar to those of the

Esquimaux that they might almost be claimed by that people. He had seen the same kind of scoring upon arrows from the French caves of the Reindeer period; and from North America, British Guiana, and Australia, he had obtained weapons bearing owners' marks of the same character, consisting of incised lines right and left of a central stem. If it were desired to introduce a written language amongst such people, no better means could be devised than by utilising this system of scoring, with which they were familiar, and adapting it to the alphabet of the language to be introduced. He believed this to be the origin of Ogham; it was a mere conjecture certainly, but he thought it was not an unreasonable one. The tradition that Ogham was a secret code of signs devised by the priesthood received no confirmation from any of the Ogham inscriptions that had been interpreted. There was nothing of a secret character about them. They were almost invariably of a memorial character, the object of which would be defeated by their being inscribed in secret letters. Had it been a cipher devised for occult purposes, it would not have been drawn up in so simple a form. The bi-literal inscriptions, moreover, in which the same words were written on the same stone, in both Latin and Ogham characters, could, he thought, have no other object than publicity; in the same way that, in our own time, we put up a notice in French and English, not for the purpose of keeping the matter secret, but to render it intelligible to all passers. There was another statement of the author's which he was able to confirm, viz. that the Oghams were older than some of the Rathes which were so abundant in all parts of Ireland. Mr. Brash had alluded to his (Colonel Fox's) discovery of Oghams in a Rath at Roovesmore.* The large stones upon which the Oghams were inscribed formed part of the roof of a subterranean crypt in the interior of the Rath. The stones were completely buried in the soil, but, on removing them it was found that the inscriptions were all on one end of them, and that each stone had a blank end left to be

* See *Archæological Journal*, 1867, vol. xxiv. p. 123.

inserted in the ground in an upright position. It is known that when Ogham is inscribed on an upright stone it invariably reads from the bottom upwards; if, therefore, these had originally been standing-stones, the inscription would read from the blank end towards the other, or top end of the stones. Upon referring them to the Ogham scale, this was found to be the case, thereby confirming, in a most remarkable manner, the conjecture that they had formerly been menhirs, and had been used by the constructors of the crypt as a handy material for their purpose, and without any regard to the inscriptions upon them, which in all probability belonged to a period long anterior to the construction of the crypt. It would be very desirable if the age of the Raths could be fixed with any approach to certainty, as this would afford a clue to the origin of Ogham; but unfortunately very little trustworthy information could be obtained respecting them. He had himself found iron implements in them, and he had on several occasions heard of the discovery of iron in connection with them. He thought it very probable that, like the crannogues, they might have continued in use up to the commencement of the Historic period, but he knew of no evidence to fix the origin of this type of earthwork. They were occasionally associated with tumuli, some of which were surrounded at the base with single or double Raths, similar to those which were usually found without a central tumulus. He had searched most of the Irish archæological publications without finding any satisfactory information on this subject. So much want of judgment had been shown in the treatment of Irish antiquities, and explorers had so often shown themselves to have been influenced by a spirit of political faction rather than a desire for truth, that the subject of Irish antiquities had fallen into disrepute. To what else could we attribute the deplorable fact that we know more of the primeval monuments of Central India or Central America than we do of those which are so abundant in Ireland? He thought, however, that the author's paper was remarkably free from the objection to which he referred: his reasoning was logical throughout, and was built upon evi-

dence to an extent that was rarely seen in the writings upon this subject. He trusted the example might be followed by other Irish archæologists, for there could be no doubt that, in their knowledge of the language, and their access to the traditions of the peasantry, they enjoyed facilities for the investigation of these subjects which few Englishmen could possess. Ireland moreover was, *par excellence*, the field for the primeval archæologist, owing to the abundance of its monuments of those days. He had counted upon the Ordnance Survey sheets no less than 10,000 Rathis in Munster alone. He had searched for many of these, and found all traces of them gone; and he believed that more than half of them had been destroyed since the survey was made, and their valuable contents scattered to the winds without any record having been kept of them. He had himself a collection of Irish antiquities, many of which he had rescued from the melting-pot; but he rarely succeeded in getting an authentic account of the source from which any of them were drawn. The Royal Irish Academy had one of the most valuable collections in Europe, but they knew little or nothing of the origin of many of the things in their museum. He trusted it might be made the subject of State interference before it was too late.

MR. E. B. TYLOR, in reply to Professor Harkness, showed that the Runic alphabet belonged to the common stock of European alphabets. The Ogham alphabet, however, was special and peculiar, and apart from everything else of the kind in the world. The theory of Colonel Fox respecting the characters being derived from arrow-marks he thought might possibly be sound.

THE PRESIDENT could not see the slightest similarity between the Ogham letters and those of any other alphabet, and especially between them and the Runic letters. He did not, however, think that the arrow-marks of savages would ever grow into letters, as Colonel Fox had suggested. He thought the origin of letters was rather a kind of picture-

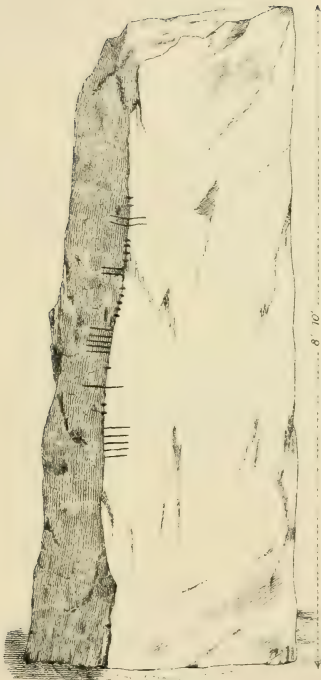
writing. It was well known that the American Indians, when treating with the President of the United States for permission to fish in the lakes, explained their wants by drawing objects and emblems, and connecting them with lines. He thought from this original style the art of writing had settled down into its present form, and from this the use of the characters now in vogue had arisen.



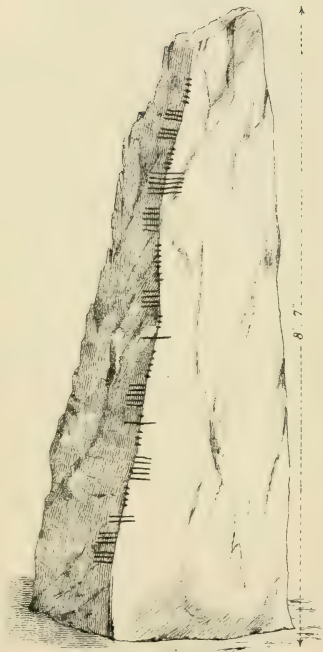
ON THE STRAND AT TRABEG
DINGLE.



BEALAMIRE
C^o CORK



ST OLANS WELL
C^O CORK.



GREEN HILL
C^O CORK.

Kell Bro^s Lith Castle St Holborn

SEVENTH MEETING.

AUGUST 28, 1868.

SIR JOHN LUBBOCK, BART., PRESIDENT, IN THE CHAIR.

This Meeting was held at Noon, in the Rooms of the Society of Antiquaries, Somerset House, London, when the following Papers were taken as read :—

L'ÂGE DU RENNE EN MÂCONNAIS. MÉMOIRE SUR LE
GISEMENT ARCHÉOLOGIQUE DU CLOS DU CHARNIER
À SOLUTRÉ, DÉPARTEMENT DE SAÔNE ET LOIRE.

PAR MM. H. DE FERRY ET A. ARCELIN.

*Compte rendu des fouilles opérées en 1867 et 1868 par MM. H. de Ferry
et A. Arcelin.*

Le gisement archéologique du Clos du Charnier* est trop important, par les questions qu'il soulève, pour ne pas mériter la plus grande attention et exciter le plus vif intérêt. On y rencontre, en effet, dans le sous-sol d'un monticule aride, des amas de débris, incontestablement de l'âge du renne, et contemporains de ceux de Laugerie-Haute en Périgord, de mystérieuses accumulations d'os de chevaux, et enfin de nombreuses sépultures humaines. Tous ces restes des temps passés ont-ils quelque liaison entre eux, et peut-on les regarder

* On dit, dans le patois local, *le Creux du Charnier*, que nous avons cru pouvoir traduire par *le Clos du Charnier*, parce que *creux* et *clos* sont étymologiquement identiques. (La transmutation des lettres *l* et *r*, et le changement de la voyelle *o* en la diphthongue *eu* et réciproquement, sont fréquents dans nos patois.) L'examen des lieux nous a conduit à adopter cette version. En effet, le nom de *creux*, pris dans le sens français, n'a pas de sens appliqué à un tertre mamelonné ; tandis qu'il y avait réellement autrefois, sur ce point, un espace clos de murs, un *clos*, dont nous mentionnerons les traces plus loin.

comme formant un tout probable? Doit-on au contraire les séparer, et dans quelles conditions? Quelles conclusions enfin est-il possible de tirer d'une analyse méthodique de cette localité? Telles sont les questions que se sont posées les auteurs de ce mémoire, après plusieurs années d'études sur ce petit coin de terre si attrayant par les découvertes qu'il leur a fournies. Aussi ont-ils pensé, que dans un intérêt scientifique bien entendu, il ne serait point inutile, après un double contrôle et un examen contradictoire, de réunir méthodiquement leurs observations et leurs appréciations personnelles. Peut-être en sortira-t-il quelques lumières pour la solution d'un problème qui intéresse si vivement l'archéologie préhistorique.*

I.—§ 1. *Le Clos du Charnier; description topographique.*—Le Clos du Charnier est un tertre inculte, naturellement gazonné, situé à Solutré (Saône et Loire), sur le talus d'éboulement qui s'incline en pente douce à la base d'un rocher élevé et escarpé à pic. Il est exposé au midi et abrité du nord par le rocher lui-même.

Ce tertre a la forme d'un mamelon, irrégulièrement trilobé, mesurant environ soixante mètres de rayon à sa base et offrant une superficie de 10,000 mètres carrés environ (soit un hectare). Quelques vallonements à peine sensibles ondulent légèrement sa surface. Il est bordé à l'Est par une profonde dépression, le long de laquelle sont alignés irrégulièrement de petits mamelons de pierres brutes. Cette dépression se prolonge, moins accentuée, en contournant le tertre comme un chemin de ronde, au nord et à l'ouest, où elle se perd dans des terrains en culture (Pl. I. fig. 1). Une source abondante s'échappe un peu au-dessous, à 200^m environ, et alimente le hameau supérieur de Solutré.

Entre la source et le grand tertre s'élève un second mamelon plus petit et moins accentué que le premier.

* Voir H. de Ferry, *L'ancienneté de l'Homme dans le Mâconnais*, 1867. A. Arcelin, *Note sur les Antiquités préhistoriques de la vallée de la Saône*, 1867. H. de Ferry, *Discours de réception à l'Académie de Mâcon*, 1868. A. Arcelin, *La Station préhistorique de l'âge du Renne de Solutré*, 1868. H. de Ferry, *L'Homme préhistorique en Mâconnais*, 1868. G. de Mortillet, *Matériaux pour l'Histoire positive et philosophique de l'Homme*, t. iii. pp. 490, 114, 415, 399, 416; t. iv. pp. 33, 35, 100, 102, 108, 154, 155. Congrès international d'Anthropologie et d'Archéologie préhistoriques, session de 1867, séance du 28 août.

Le rocher, qui domine le Clos du Charnier, est une énorme masse inclinant en pente douce sa croupe arrondie vers l'Est, et se terminant à l'ouest en une pointe étroite, escarpée à pic sur trois côtés.

§ 2. *Description géologique.*—Le sol primitif du Clos du Charnier, jusqu'aux plus grandes profondeurs auxquelles nos sondages ont été poussés (2^m 40^c environ) est, de haut en bas, exclusivement formé de détritits dûs à la désagrégation séculaire des roches bajociennes des escarpements supérieurs. C'est du reste la composition ordinaire de tous les talus situés au pied des falaises de l'oolithe inférieure dans nos contrées. C'est le recouvrement obligé des affleurements du lias supérieur. En général, la masse de ce terrain détritique est composée de menues pierrailles, au milieu desquelles se rencontrent de temps en temps d'assez gros blocs dont plusieurs ont dû rouler naturellement à différentes époques des rochers voisins, ainsi que des dalles du calcaire à fucoïdes qui, au contraire, privées d'un plan de glissement convenable, et trop éloignées de leur point de départ, ne peuvent s'y rencontrer que par suite d'un apport artificiel.

Cette couche de détritits forme, au Clos du Charnier, un relief beaucoup plus accentué que toutes les autres ondulations voisines produites par les gonflements et les glissements des marnes sous-jacentes du lias supérieur. Très-épaisse au sommet du tertre, où elle semble même développée contrairement aux lois naturelles de l'éboulement, elle va diminuant vers la circonférence, de telle façon que les marnes du lias affleurent sur les bords de la dépression circulaire, et particulièrement à l'Est, sous les monticules de pierres brutes.

Il est difficile d'expliquer l'origine de cette dépression circulaire : on peut l'attribuer en partie aux carrières encore exploitées au nord du tertre ; en partie à un travail intentionnel primitif, là où il n'y a pas de carrières, à l'ouest, par exemple ; et peut-être enfin à des effets géologiques, à l'Est surtout, où elle correspond à une faille et se présente sous la forme d'un véritable ravin.

Quant aux mamelons de pierres brutes qui s'élèvent à l'ouest, ils sont entièrement formés de fragments de roches provenant des abruptes de l'oolithe inférieure environnante

(blocs de calcaire à polypiers, de calcaire à entroques, et de calcaire à fucoides). Peut-être la nature avait-elle amené là ces matériaux par voie d'éboulement ; mais ils paraissent avoir été remaniés et entassés artificiellement.

§ 3. *Vestiges superficiels.*—Tout le versant nord du vallon de Solutré, occupé en partie par le village actuel, est jonché de silex taillés ; on les voit blanchir dans les jardins et dans les chemins. Leur intensité augmente à mesure qu'on se rapproche en montant de la base du grand escarpement appelé la Roche, ou le Rocher. Dans les vignes situées immédiatement au-dessus des dernières maisons du village, aux lieux dits à *la levée*, à *la colonne*, on voit apparaître, outre les silex, de nombreux ossements de cheval mêlés de quelques débris de renne, dispersés par la culture. Mais le véritable lieu de concentration des silex taillés et des ossements est le Clos du Charnier. La culture n'ayant pas encore atteint ce point, il était resté, jusqu'à nos jours, vierge de tout bouleversement et de toute recherche. Quelques fosses seulement, creusées pour l'extraction de la pierraille, y ont mis sur plusieurs points à découverte les anciens amas d'ossements. C'est évidemment à l'accumulation de ces débris d'animaux qu'il faut attribuer le nom de Clos, ou de Creux du Charnier. L'imagination populaire a trouvé fort simple d'expliquer le fait par une bataille livrée à une époque inconnue au pied du château qui, au moyen âge, couronnait la roche. D'autres prétendent qu'on enterrait là les chevaux de la garnison.* Tels sont les renseignements que nous ont fournis les traditions locales. On va voir plus loin, qu'il est prudent de ne pas les accepter sans contrôle.

Dans la portion ouest du tertre apparaissent les traces d'un mur d'une époque indéterminée, formé de gros blocs superposés, sans ciment (Pl. I. fig. 1). Ce mur, qui remonte jusqu'à la dépression située au nord du monticule, au pied de la roche, retourne à angle droit, dans la direction de

* Il n'est pas probable qu'on ait jamais eu pour la desserte du château autre chose que quelques bêtes de somme ; il est tout-à-fait inadmissible que des milliers de chevaux aient jamais pu manœuvrer dans un espace aussi restreint, et sur un pareil terrain, ni que l'on ait jamais pensé à attaquer un nid d'aigle comme Solutré avec de la cavalerie.

l'Est, et paraît avoir circonscrit un vaste carré long. Il est, de toute évidence, postérieur aux débris souterrains, dont nous allons parler plus loin (amas de débris de cuisine, amas de chevaux et sépultures), puisqu'il les coupe en plusieurs endroits. De plus, l'équarrissage de ses gros moëllons indique aussi une époque quelconque de la période du fer.

A la limite méridionale actuelle de la friche et des vignes, et à côté des excavations modernes qui longent un sentier descendant de la montagne, il existe également des traces, à fleur de terre, d'une petite construction de chétive apparence, mais en matériaux néanmoins également équarris.

Outre les silex et les ossements de renne ou de cheval dont nous avons déjà parlé, on aperçoit encore, çà et là, gisant épars à la surface, des éclats de pierres dures étrangères à la localité, puis de rares tessons de poterie, appartenant soit à l'époque gallo-romaine soit au moyen âge (quelques-uns vernissés), et enfin des fragments de vases d'une pâte noirâtre ou grisâtre, ornés parfois de bandelettes, et dont la véritable origine, qu'elle soit gauloise ou burgonde, n'est malheureusement pas encore hors de doute.*

C'est là qu'au mois de septembre 1866 nous avons commencé nos sondages et nos fouilles, poursuivies depuis sans interruption.

§ 4. *Vestiges souterrains.*—Les vestiges souterrains, exhumés de ces fouilles, se subdivisent à leur tour en gisements divers que nous classons ainsi: 1. Débris épars dans le sous-sol. 2. Amas de rebuts de cuisine. 3. Accumulation de débris de chevaux. 4. Sépultures. Nous allons les étudier séparément.

§ 5. *Débris épars dans le sous-sol.*—Les premiers débris que l'on rencontre dans le sous-sol sont l'exacte répétition, sauf un meilleur état de conservation, de ceux qui jonchent superficiellement le Clos du Charnier. Quelques tessons de la poterie problématique que nous avons signalée plus haut, ou de l'époque du moyen âge, et un fragment de brique d'origine incertaine, se sont rencontrés à des profondeurs variables, depuis 0^m 10 jusqu'à 0^m 50; et plus particulièrement dans le voisinage du gros mur dont il a été question, ainsi que

* Voir A. Arcelin, *Les Berges de la Saône*, 1868. H. de Ferry, *Les Gisements archéologiques des bords de la Saône*, 1868.

c'était déjà le cas pour leurs analogues, dispersés à fleur de sol. Du reste, leur nombre (tant des uns que des autres) ne s'élève pas à plus d'une *douzaine* !

Lorsqu'on attaque le sol pour exécuter un sondage (Pl. fig. 4), on rencontre dès les premiers coups de pioche des silex épars, des os disséminés, soit de renne, soit de chevaux, et quelquefois des débris humains. Parmi les silex, les uns paraissent avoir servi à un long usage et sont éraillés ; les autres, au contraire, semblent tout neufs ; les uns sont entiers, les autres brisés. Les os de chevaux ou de renne ne se suivent jamais, comme ceux d'animaux dont les squelettes avaient été enfouis tout entiers. Ici des dents, là des fragments de cornes ou de mâchoires, des canons ; plus loin des phalanges, des astragales, des bois, des côtes ; les uns plus ou moins avariés, les autres en très-bon état ; le tout sans suite, pêle-mêle et à des niveaux différents. Des dents ou des phalanges de renne se trouvent juxtaposées, par exemple, à des métatarses de chevaux, etc. A côté de fémurs de cheval intentionnellement brisés, on trouve des canons du même animal entiers. (Remarquons par anticipation, que ces débris des couches supérieures du sous-sol ont tout le facies de leurs congénères que nous signalerons plus loin dans des gisements non remaniés, désignés soit sous le nom d'amas de rebuts de cuisine, soit sous celui d'accumulation de débris de chevaux ; que de plus l'état de conservation des uns et des autres est en tout identique, et identique aussi aux débris humains qui leur sont parfois associés.)

§ 6. *Amas de rebuts de cuisine.*—Au-dessous de ces couches remaniées à débris épars on rencontre des gisements beaucoup plus riches en produits de l'industrie humaine que nous appelons amas de rebuts ou de débris de cuisine (ou d'habitation).

Ces amas se trouvent concentrés sur la partie ouest du monticule, de chaque côté et au-dessous du chemin qui mène aux carrières. Leur emplacement semble former un trapèze allongé (Pl. fig. 1), mesurant 462^m carrés de superficie ou environ, et encadré par une large et épaisse bordure d'ossements de chevaux, qui entoure, comme d'un fer à cheval, le côté sud et la moitié des grands côtés Est et ouest du trapèze.

Ils occupent des niveaux variables. Les uns se rencontrent quelquefois à 0, 40 ou 0, 50 centimètres seulement au-dessous de la surface actuelle ; tandis que d'autres ne commencent à se montrer qu'à 1^m, 1^m 30, 1^m 40, 1^m 50. Quelques-uns enfin se prolongent jusqu'à 2^m 30 de profondeur. Parfois, plusieurs de ces amas sont superposés, et, dans ce cas, séparés soit par de la terre noirâtre très-pauvre en débris, soit par un sol qui semble vierge.

En beaucoup de points ils se touchent par leurs extrémités, mais d'autrefois ils semblent nettement séparés par de la terre pure. Les uns reposent sur des plans horizontaux, les autres sur des plans déclives. Enfin en quelques endroits il existe de petits îlots de terrain vierge, entourés par des amas de débris dont la pente est très-prononcée.

Ces amas varient aussi en intensité, en composition, en richesse. Tantôt ils se réduisent à de simples traînées ou à quelques filets noirâtres de matières cendreuse, dans lesquels sont dispersés quelques os ou quelques esquilles d'os brûlés ou non, et de petits éclats de silex (quelquefois les fragments d'os sont blanchis et les cendres grisâtres, comme si avant leur enfouissement ils étaient restés exposés un certain temps aux influences atmosphériques) ; tantôt ils offrent un plus grand développement, mais ne renferment encore que des os éclatés ou des esquilles nombreuses (la plupart sans traces de feu) ; quelques fragments de bois de renne, grossièrement incisés ; d'assez nombreuses lames en silex, mais peu de silex ouvrés d'une façon caractéristique ; des fragments de grattoirs et diverses substances minérales étrangères à la contrée ; tantôt enfin, ils prennent des proportions considérables et constituent un ensemble bien défini, qui abonde en débris des plus intéressants.

Ces grands amas se font ordinairement remarquer par de nombreux et longs fragments de perches de renne, avec portions de corne encore souvent adhérentes ; * par des bois déjà façonnés diversement en marteaux † ou en manches d'outils ; par de nombreuses mâchoires de renne éclatées, des

* Parfois même on dirait que ces cornes ont été empilées intentionnellement.

† Ces marteaux consistent en fragments de *perches* plus ou moins longs ou plus ou moins gros, dont on a poli la base de la *meule*, de manière à obtenir une surface

canons brisés pour la plupart, de nombreuses phalanges, des vertèbres et des côtes en assez grande abondance, contrairement à ce que l'on observe habituellement dans d'autres stations du même âge; quelquefois aussi par quelques os ayant conservé leur juxtaposition normale.* Enfin par une quantité de silex,† grattoirs de toutes formes, pointes de flèches ou de lances, entières ou brisées, couteaux et racloirs, retouchés ou non sur les bords, poinçons, lames minces et tranchantes, esquilles et nucléi. On retrouve ici et là des pièces d'un fini achevé, ou des pointes de lames simplement dégrossies, et même des pièces cassées au moment de la taille.

Puis viennent ‡ des objets empruntés à la minéralogie des contrées voisines pour divers usages : des cailloux roulés de la Saône ou du diluvium de la Bresse, destinés sans doute à concasser les os; des fragments de porphyre ou de granit et des rognons de peroxyde de manganèse, qui ont eu probablement le même emploi; des morceaux de sanguine employés

légèrement convexe. Le premier cors ou andouiller est toujours cassé à sa partie supérieure, tandis que la base subsiste sans exception. Le reste de la perche, au-dessus du premier andouiller, sert de manche. Un de ces marteaux, formé d'un énorme bois de cerf ordinaire, est percé à l'extrémité de son manche d'un large trou de suspension.

* Nous citerons : 1° une astragale emmanchée encore dans un tibia; 2° une astragale, un calcaneum et un os scaphoïde, en rapport—preuve que quelques-unes des jambes de renne n'ont point été désarticulées.

† Toutes les armes en silex de Solutré sont extrêmement minces, légères, quelquefois très-grandes de proportions, d'une taille très-fine, très-habile comparable à celle des plus belles armes du Danemarck. Quoique très-variées de forme, elles peuvent rentrer dans trois types principaux :—1° le type dit en feuille de laurier, ou à deux pointes symétriques; 2° le type à base arrondie; 3° le type en losange. Ajoutons à cela des grattoirs-pointes, d'un type assez particulier, rencontré aussi par M. Lalande à la grotte du Touzet. (Dordogne.) Ces silex sont empâtés ou non par des conditions calcaires. Libres, ils sont entièrement patinés à tous les niveaux où on les rencontre, et quelques-uns sont transformés complètement en silice pulvérulente. Cette même patine se montre également sur les parties visibles des silex concrétionnés, mais elle n'existe pas sous les concrétions où persiste la couleur naturelle—preuve que ce changement de couleur du silex et la transformation moléculaire qui en a été la suite, ont eu lieu postérieurement à l'enfouissement de ces objets.

‡ Nous reviendrons encore souvent sur les concrétions calcaires qui revêtent les différents objets du gisement, parce qu'elles ont jeté un grand jour sur plusieurs points de nos études. En voici un nouvel exemple : lorsque les silex sont concrétionnés, c'est toujours à leur partie inférieure, le carbonate de chaux des eaux infiltrantes s'étant déposé sous la pièce, absolument comme des stalactites se déparent

comme couleur ou comme polissoirs ; * des fragments de calcaire magnésien jaune, utilisés peut-être encore comme matière colorante ; des plaques de gris siliceux du trias, polies par frottement ; des morceaux assez volumineux de cristal de roche très-pur, et un certain nombre de fossiles appartenant à divers terrains, apportés intentionnellement et selon toute apparence comme objets de curiosité. † Dans toute la masse sont disséminés de petits fragments d'os carbonisés, plus ou moins gros, quelquefois pulvérulents. ‡ Il ne reste aucune trace du charbon qui aurait pu provenir des végétaux employés à alimenter les feux.

Il existe généralement, dans le voisinage de ces grands amas, d'autres accumulations parfaitement analogues de composition, mais composés de débris avariés, où la cendre domine, et que nous considérons comme formées par l'apport prolongé de balayures. Ces accumulations, relativement pauvres, se rencontrent soit à la circonférence des amas les plus riches, soit en contrebas de ces derniers, comme si elles s'étaient formées dans des dépressions du sol primitif. Mais

sous une voûte de rocher. Ce mode de concrétions a fourni à l'un de nous le moyen de constater peut-être l'un des nombreux épisodes de la taille du silex, au moment même du bris d'une grande tête de lance que l'on voulait achever. Un défaut dans la pointe de l'arme avait amené par contre-coup sa séparation médiane en deux parties, qui gisaient à plat à la suite l'une de l'autre dans un amas de cendres. Ces morceaux étaient tous deux concrétions inférieurement dans la position où ils avaient dû arriver à terre en échappant des mains de l'ouvrier ; car le plan sur lequel ils gisaient était horizontal, et les arêtes des brisures paraissaient dans toute leur fraîcheur. Mais l'un d'eux était tombé à l'envers, car il fallait retourner la *partie concrétionnée* pour le rajuster à l'autre morceau.

* Un échantillon d'hématite est buriné comme si la matière rouge avait été enlevée à petits coups de pointes de silex. Un autre, au contraire, est usé sur ses arêtes vives et sur ses faces, comme par un frottement assidu, et l'admirable poli d'un poinçon en os que nous avons recueilli ne laisse guère de doute sur l'emploi de l'hématite comme brunissoir.

† Un fragment d'*Am. planula*, des calcaires marneux blancs jaunâtres de la base de l'étage bathonien, présente dans l'intervalle de chacune de ses côtes une petite raie gravée, très-visible, obtenue probablement avec une pointe acérée de silex.

‡ Bien que la présence d'os ainsi carbonisés implique l'existence d'anciens foyers, nous n'avons pas cru devoir donner exclusivement le nom de foyers à nos amoncellements, puisque la plupart des débris qui les composent, silex, cornes, os travaillés ou brisés, ne présentent aucune trace de combustion. Nous l'emploierons cependant parfois comme équivalent.

leur intensité est toujours en rapport avec celle des amoncellements frais et riches qu'elles avoisinent.*

La coupe transversale (Pl. II. fig. 6) de nos amas de débris de cuisine types, les plus considérables, présente à peu près la forme d'une section de cône surbaissé. L'un d'eux, qui renfermait beaucoup de bois de renne, un grand os d'éléphant, long de 0^m 80^c, et de très-beaux silex, entre autres une superbe pointe de lance, placée sous l'os lui-même, mesurait environ 3^m de diamètre, et 0,60^c dans sa plus grande hauteur. A part quelques os brûlés, formant un résidu noir et cendreuse, tous les débris d'animaux sont, comme nous l'avons déjà dit, d'une conservation étonnante. On pourrait les croire frais. Certaines cornes de renne sont encore extrêmement dures, et dégagent, quand on les travaille, l'odeur de la corne fraîche. Les os fragmentés ont conservé une quantité considérable de leur gélatine.† Enfin ce qui n'est pas moins intéressant à noter c'est que tous ces amas de débris de cuisine reposent d'ordinaire sur des dalles brutes en nombre plus ou moins considérable. Ils sont également recouverts par d'autres dalles protectrices dont la constance est si caractéristique que toutes les fois que nos pioches venaient à les rencontrer, nous pouvions prédire à coup sûr l'existence d'un foyer sous-jacent, et que nous n'avons jamais été trompés dans nos prévisions. En effet, une fois la dalle enlevée, sa partie inférieure offrait de nombreux débris adhérents ou des traces de matière cendreuse ; puis l'amas se montrait intact avec sa composition ordinaire, et parfois des instruments en silex (lances, flèches, grattoirs et éclats) apparaissaient à la surface dans un tel état de conservation, qu'il semblait qu'ils eussent été déposés là pour être repris à la première occasion.

* Nous avons pu constater, à 2^m 30^c de profondeur, un épais et vaste amas de balayures dont les trainées remontaient obliquement jusqu'à un vaste foyer situé seulement à 0^m 60^c au-dessous de la superficie du sol—preuve qu'il existait autrefois en cet endroit un talus fort et rapide.

† L'un de nous en a la preuve par le fait suivant : beaucoup des silex des amas étant, comme nous l'avons déjà signalé, encroûtés par des dépôts calcaires et portant des esquilles d'os agglutinés à leur surface, il est nécessaire, pour les dégager, de les faire tremper dans un bain d'acide chlorydrique étendu d'eau. Or au bout d'un certain temps les os ainsi adhérents se trouvent recouverts d'une matière gélatineuse, molle et translucide, qui par la dessiccation redevient opaque et cassante. D'ailleurs, ces os, mis au feu, dégagent encore une odeur très-forte et deviennent noirs.

Le renne forme presque à lui tout seul les débris de cuisine. On le retrouve à tous les âges et on ne peut guère évaluer à moins de plusieurs centaines le nombre des individus réunis sur l'étroit espace occupé par les amas, qui, d'ailleurs, se touchent presque tous.* Les parties les plus abondantes de son squelette sont les bois, les maxillaires inférieurs généralement écrétés à la base, les tibias et les métatarses également brisés, les astragales, les calcanéums et les phalanges : les vertèbres et les côtes, quoique relativement plus rares, se rencontrent cependant en certaine quantité. Les dents incisives seules semblent faire presque entièrement défaut.

Par contre, le cheval est relativement peu abondant dans les amoncellements à débris mélangés, ou foyers. Mais il existe quelques petits foyers presque exclusivement composés des os fragmentés de cet animal, et, chose assez remarquable, les pointes de flèches et de lances si communes ailleurs ne s'y montrent pas. Les grattoirs y sont rares, tandis que les simples éclats y abondent, et que l'on y retrouve comme à l'ordinaire la même variété de pierres dures propres à concasser les os. En général on peut dire que partout où prédominent les belles cornes de renne, c'est-à-dire, dans les grands foyers, là se trouvent toujours aussi les silex les plus beaux et les plus variés de forme. Il en est de même pour les amas qui ont fourni des os ou des fragments de défense d'éléphant.

Au renne, au cheval et à l'éléphant il faut ajouter, pour clore la liste des débris d'animaux des foyers, quelques autres fragments beaucoup plus rares, mais qui complètent nos renseignements sur une partie de la faune qui habitait alors ces parages. Ce sont : 1° deux énormes bases de cornes de cerf commun (*Cervus elaphus*) façonnées en marteaux ; puis deux forts canons ayant appartenu probablement au même animal ; 2° un os scaphoïde, une astragale, une phalange

* Nous avons recueilli près de 400 bases de perches encore pourvues, pour la plupart, de leurs meules—ce qui donnerait un troupeau de 200 têtes, à supposer que tous les bois puissent s'appareiller deux à deux. Mais il s'en faut bien qu'il en soit ainsi. On doit donc admettre que le nombre des rennes a dû dépasser ce chiffre. Leur prédominance dans les foyers de Solutré semble indiquer le cantonnement presque exclusif de ce gibier dans la partie montagneuse du Maconnais.

onguéale, un tibia et plusieurs dents d'un très-grand bœuf, de dimensions semblables à celles de l'aurochs ; 3° des fragments de mâchoire de renard et une canine de ce dernier animal, percée à sa racine d'un petit trou de suspension ; 4° trois canines de loup, dont l'une est également trouée intentionnellement ; 5° une canine de grand tigre des cavernes.

Si la plupart du temps les débris qui constituent les amas sont à l'état libre, c'est-à-dire meubles, cependant sur quelques points ils forment, ainsi que nous l'avons fait pressentir, des conglomérats ou magmas solides. De cette façon l'ancien état de choses a été, si nous pouvons nous exprimer ainsi, pris sur le fait, et se révèle dans toute son intégrité bien mieux encore que ne peuvent le démontrer les coups de pioche les plus prudemment appliqués. Ainsi l'on voit qu'à l'époque où les amas ont été abandonnés, le mélange d'objets de toute nature qui les constituent était complet et n'a subi aucun dérangement postérieur ; la fraîcheur des arêtes des os brisés, la cassure franche des silex, leurs parties quelquefois juxtaposées quoique brisées, leur couleur naturelle conservée sous les concrétions, couleur qui s'altère très-rapidement à l'air libre dans nos contrées,* etc., le démontrent suffisamment. Donnons quelques exemples de ces mélanges. A côté d'une moitié de maxillaire inférieur de renne, le même bloc renferme un fragment de bois et une phalange du même animal. Une tête de flèche en silex leur est adhérente,† mais elle se trouve brisée en deux morceaux, et la pointe de sa base est tournée vers la cassure médiane de l'autre morceau. Puis çà et là, à travers tout le reste de la masse, composée de pierrailles et de fragments plus ou moins volumineux, d'autres cornes ou d'autres os brisés à l'état frais, beaucoup de petits morceaux d'os carbonisés d'un noir de jais, ou bien seulement bleuâtres, ou encore complètement blanchis. Ailleurs c'est une moitié de lance empâtée isolé-

* D'après nos expériences, il ne faut pas plus d'un mois d'exposition au soleil et à l'air pour que la couleur de certaines variétés de nos silex s'altère notablement.

† Ne serait-il pas possible qu'une partie des pointes de flèches ou de lances recueillies dans les amas de débris de cuisine n'y ait été apportée dans la dépouille même des animaux auxquels ces armes avaient donné la mort ?

ment ; ici au contraire se trouve un couteau brisé par compression, mais dont les deux fragments sont juxtaposés ; plus loin c'est encore une grande perche de renne cassée de la même manière, etc. Enfin, certaines dalles recouvrantes peuvent être comparées elles-mêmes à des sceaux restés intacts, car elles adhèrent fortement aux magmas.

Nous devons mentionner aussi des *objets d'art* consistant en os, en bois de renne, ou en pierres travaillées. Mais disons-le, les produits de cette sorte sont très-rares et très-primitifs au Clos du Charnier. La pièce principale est un petit renne, d'une facture barbare, mais très-suffisamment indiqué, sculpté en pierre tendre. C'est la seule représentation animale trouvée dans nos fouilles.* Un fragment d'os présente de petites bossettes assez habilement ménagées dans l'épaisseur de l'os. Une plaquette de l'étage bathonien (Lias inférieur) a été dressée, polie, puis découpée dans une forme difficile à expliquer, et ornée sur ses bords de nombreuses petites encoches régulièrement espacées. Beaucoup de bois de renne ont été creusés pour servir de manches d'outils, ou taillés, comme nous l'avons dit, pour servir de marteaux. Deux dents, l'une de loup et l'autre de renard, sont percées d'un trou de suspension. Le reste consiste en quelques poinçons, en os polis, striés ou ornés d'encoches. Un grand nombre de fragments de bois de renne portent à leur extrémité le trait de scie qui a servi à les diviser.

Enfin il nous reste à signaler, pour finir, trois ou quatre fragments de poterie grossière, jaune, très-calcaire, mal cuite, faite à la main, et analogue à la poterie néolithique des bords de la Saône. Un de ces fragments, recueilli à 0,60° de profondeur, dans le terrain remanié superficiel, un peu au-dessus d'un foyer, portait même une anse mamelonnée très-caractérisée.† Mais ce morceau peut être postérieur aux foyers, quoiqu'il offre la plus grande analogie de pâte avec les débris de poterie recueillis dans les foyers eux-mêmes.

§ 7. *Amas de débris de chevaux.*—Ces amas constituent,

* Voir H. de Ferry, Revue Archéologique, mars 1868, pp 207-212, Pl. VII.

† L'anse mamelonnée, abondante à l'époque de la pierre polie, s'est déjà rencontrée antérieurement. M. E. Lartet nous écrit à ce sujet, qu'il en possède une provenant de ses fouilles de la grotte d'Aurignac (âge du grand ours).

ainsi que nous l'avons dit, autour d'une partie de l'enceinte où sont accumulés les débris de cuisine et d'habitation que nous venons de décrire, une bordure dont la largeur n'a pu être périmétrée exactement, mais qui, dans l'état actuel de nos constatations, est considérable, puisqu'elle présente une épaisseur moyenne de 0^m 50^c, et qu'elle recouvre d'une manière continue une surface de terrain équivalente à 849^m carrés. Ces amas, qui sur quelques points font des angles saillants et rentrants à la limite des foyers, se montrent, comme ces derniers (Pl. I. fig. 1 et 3) à des profondeurs inégales, tantôt presque à fleur du sol, tantôt jusqu'à des profondeurs de 1^m 30^c et même de 2^m 40^c. Ils sont ordinairement juxtaposés aux amas de débris de cuisine; mais en quelques endroits ils s'enfoncent au-dessous de plusieurs d'entre eux de la manière la plus incontestable. Une fouille poussée à 2 40^c de profondeur nous les a montrés sous un foyer non remanié qui semblait avoir été creusé au milieu d'eux (Pl. II. fig. 5). A quelque distance de là, au-dessus du talus souterrain dont nous avons déjà eu l'occasion de parler, un grand et beau foyer, avec renne et éléphant, bois (plus de cinquante) et silex nombreux, dalles recouvrantes, sous l'une desquelles se trouvaient disposés à plat une grande tête de lance, une pointe de flèche, un grattoir et une lame, avait pour soubassement un lit d'environ 0^m 60^c d'épaisseur d'os de chevaux, qui renfermait lui-même, un peu plus loin, un autre foyer intercalé. C'est du reste à la lisière seule des véritables foyers qu'ont lieu ces intercalations et ces superpositions. Au delà les débris de chevaux règnent et se continuent seuls. Nous ne les avons jamais rencontrés non plus dans l'intérieur de l'enceinte des débris de cuisine, de sorte que toutes nos recherches nous ont amenés à constater ce fait, que là où cessent les foyers, là commencent les accumulations de débris de chevaux. Ces amas, composés de débris soit meubles soit transformés en magma,* ont du

* Les magmas ne se rencontrent ordinairement qu'à une certaine profondeur—fait qui concorde avec la manière dont s'opèrent généralement les agrégations dans les terrains perméables. On sait en effet que l'eau de pluie, quand elle tombe sur un sol où des matières végétales sont en voie de décomposition, peut se charger d'une certaine quantité d'acide carbonique, et acquérir ainsi le pouvoir de dissoudre

reste une composition exclusive et toujours identique. Il n'y a que du cheval, rien que du cheval, absolument que du cheval, et partout dans les mêmes conditions. Tous les os ou débris d'os ont subi l'action du feu; tous ont une légère teinte bleuâtre à leur sortie de la terre; blanchissent en peu de temps, et, une fois secs, happent fortement à la langue et absorbent l'eau avec avidité. Enfin, çà et là, dans les magmas, se retrouvent quelques esquilles entièrement carbonisées. Le mélange des débris est en outre complet: ici une phalange onguéale ou un canon entier, noyés dans des masses d'esquilles triturées de toutes les dimensions ou accolées à deux ou trois dents très-souvent retournées en sens inverse les unes des autres; là un fragment de mâchoire, perdu au milieu de phalanges ou de débris de tibias et de fémurs; ailleurs une tête de fémur brisée à la base et cimentée avec des fragments de dents ou des esquilles; le tout tassé sans le moindre intervalle, sans objets étrangers ou pierrailles adventices, comme dans les débris de cuisine, mais formant une masse serrée, homogène, compacte, une espèce de béton si l'on veut. Un mètre cube environ de ce magma a fourni à l'un de nous quarante canons entiers, ce qui donnerait pour la superficie connue occupée par ces amas une moyenne d'environ 2122 chevaux. Si les canons se présentent généralement entiers, il n'en est pas de même des fémurs et des tibias, qui sont assez souvent brisés. Mais les cassures de ces os, ainsi que les esquilles, n'offrent plus, comme ceux du renne, des arêtes vives, nettes et franches. Au contraire, leurs angles sont émoussés et leurs pointes arrondies. On dirait que les brisures ont eu lieu après que ces ossements avaient perdu une partie de leur solidité. Du reste, au milieu de tant de débris, pas un seul de ces cailloux con-

quelques parties des matériaux calcaires à travers lesquels elle s'infiltre. Les couches inférieures où cette eau descend, devenant plus froides, la température du dissolvant s'abaisse, et la matière minérale tend alors à s'en séparer et à se déposer sous forme solide. Au clos du charnier les os isolés, répandus çà et là dans le premier sous-sol, ne sont jamais revêtus de concrétions. Cependant à peu de distance de la superficie actuelle, on rencontre des *magmas* dans les endroits où les ossements sont réunis en grand nombre, tandis que sur d'autres points, malgré leur abondance, ils sont restés libres. Ce fait ne prouverait-il pas qu'autrefois les magmas superficiels étaient à une plus grande profondeur qu'à présent?

casseurs en pierre dure si fréquents parmi les ossements de renne. Sur deux ou trois points seulement, nous avons recueilli une certaine quantité d'éclats ou de couteaux épars çà et là ; mais avec cette particularité, que tous avaient intégralement conservé leur tranchant primitif, et n'avaient par conséquent jamais servi.

§ 8. *Sépultures*.—Les sépultures du Clos du Charnier sont aussi groupées sur l'espace occupé tant par les foyers que par les amas de chevaux. Toute la portion orientale du monticule, où cessent les différents amas, en est absolument privée.

Elles peuvent se diviser en deux catégories :—1° les sépultures en dalles brutes ; 2° les sépultures dans la terre libre. Elles sont en outre réparties ainsi qu'il suit :—les premières, soit sur des amas de débris de chevaux, soit dans le sous-sol ordinaire ; les secondes sont également soit sur les débris de chevaux, soit sur les foyers, soit dans le sous-sol ordinaire. Un certain nombre d'entre elles ont dû être violées à une époque qu'il est assez difficile de déterminer ; car on rencontre soit des tombes qui n'ont conservé que des restes insignifiants, soit des os humains épars dans la couche la plus superficielle du terrain. Aucune de ces sépultures n'a une orientation déterminée, et la position des cadavres paraît subordonnée à la pente et aux accidents du terrain. Elles gisent comme les foyers et les amas de chevaux à des profondeurs inégales.

Nous n'avons pas à revenir sur les sépultures en dalles brutes dont nous avons déjà eu l'occasion de parler ailleurs avec détail.* Rappelons seulement que l'une d'elles, retrouvée intacte et explorée par l'un de nous, se présentait sous la forme d'un caisson rectangulaire bien joint et bien fermé, quoiqu'en dalles non équerries, établi sur le magma de cheval. Le squelette, qui était celui d'une femme finnoise, reposait étendu sur des os brûlés et pilés : il avait à ses côtés des os de cheval et de renne et trois couteaux de silex.

Les sépultures gisant dans la terre libre du sous-sol ordinaire sont plus ou moins dispersées, du moins dans l'état de choses actuel. Quelques-unes paraissent avoir été recou-

* Voir H. de Ferry, *Disc. de réception à l'Acad. de Mâcon*, 1868 ; id. *L'Homme préhistorique en Mâconnais*, 1868.

vertes intentionnellement de pierres amoncelées, sans cependant qu'il soit possible de le démontrer complètement. Quelques autres présentent une lave ou une pierre brute de petite dimension, dressée souterrainement à côté du squelette. Enfin presque toutes sont accompagnées de débris d'os de renne ou de cheval, quelques-uns carbonisés, et de silex, y compris celles (dont le nombre est très-restreint) qui, placées sur l'extrême limite des foyers et des amas de chevaux, ne semblent plus recouvertes que par de la terre pure.

Enfin les sépultures établies sur des foyers offrent, comme on va le voir, beaucoup plus d'intérêt. Elles sont réunies en grand nombre et de manière à se toucher presque toutes, sur l'emplacement même des accumulations de débris de cuisine. La plupart des foyers supportent un ou plusieurs squelettes, dont la profondeur est en relation directe et constante avec la profondeur du foyer lui-même.* Si, par exemple, le foyer commence à 0^m 60^c de la surface actuelle, le mort n'est qu'à cette profondeur. Si au contraire celui-ci est déposé à 1 50^c ou 1^m 80^c, le foyer alors n'apparaît qu'à ce niveau. Les individus se trouvent placés tantôt dans l'axe du foyer lui-même, tantôt par côté. Ils reposent sur le dos, les jambes étendues et les bras rapprochés du corps. Un cadavre pourtant a fait exception à cette règle, car, déposé à côté d'un foyer, il avait le bras gauche étendu sur celui-ci, faisant ainsi un angle droit avec le reste du corps. Il résulte de la position même des squelettes sur des foyers ou amas de débris plus ou moins coniques, que les corps ne sont jamais dans une position horizontale, mais inclinés à droite ou à gauche, les pieds ou la tête plus haut ou plus bas, comme s'ils avaient glissé sur d'anciennes déclivités.

Les squelettes sont le plus souvent intacts, complets; tous les os se présentent dans leur ordre régulier, mais quelquefois brisés ou écrasés par le poids du terrain. Leur conservation est parfaite. Cependant, comme nous l'avons dit, quelques sépultures avaient été antérieurement violées. De plus, un cadavre, bien entier d'ailleurs, et ne paraissant avoir été

* Quelques-uns de ces squelettes sont même complètement dans les foyers. Nous y avons déjà trouvé, il y a longtemps, des phalanges humaines, des dents, des fragments de tibias ou d'autres os brisés, intimement mêlés aux débris de cuisine.

aucunement dérangé, étendu sur un foyer, était privé de sa tête.

Si les squelettes sont entiers et exempts de profanations, en revanche un assez grand nombre de leurs os paraissent avoir subi l'action d'une certaine chaleur. Ils présentent comme les débris de chevaux des magmas, des taches bleuâtres, blanchissent rapidement, happent fortement à la langue et sont couverts de petites papilles d'esquilles et d'excroissances qui ont paru au Dr. Pruner-Bey pouvoir provenir 'd'une chaleur d'ailleurs peu intense.'

Enfin, ce qui n'est pas moins digne de remarque, la grandeur et l'importance des amas de débris de cuisine ou des foyers est en quelque sorte en rapport soit avec le nombre des débris humains qui les couronnent, soit avec l'âge des individus enfouis. Ainsi aux grands foyers en général les vieillards, les hommes faits ou les femmes, et aux petits foyers les enfants. Dernièrement, l'un de nous fouillant un endroit où il y avait discontinuité de foyer, tomba tout à coup sur un tout petit foyer, presque exclusivement composé d'os de cheval, avec une grande quantité de lames de silex, sur lequel reposait un petit corps d'enfant pourvu encore de ses dents de lait. Quelques jours après nous découvrîmes un nouveau squelette d'enfant, du même âge ; cette fois le terrain sous-jacent ne contenait que quelques débris d'os brûlés indéterminables.

Comme nous l'avons dit, il y a dans ce vaste ossuaire des individus de tout âge et de tout sexe ; mais les vieillards et les enfants paraissent dominer. Le nombre total des individus que nous avons pu reconnaître s'élève actuellement à environ cinquante—chiffre qui, hâtons-nous de le reconnaître, ne représente certainement qu'une partie des anciennes inhumations, attendu que les débris de rennes et de chevaux se prolongeaient autrefois, bien au delà du cercle possible de nos investigations, dans les vignes environnantes, où l'on a signalé aussi des sépultures détruites depuis longtemps.

Observons encore, que malgré tout notre soin à recueillir et à examiner les plus minimes débris de cette nécropole, nous n'avons jamais trouvé dans ses profondeurs autre chose que des ossements, des pierres dures de nature diverse, des os

travaillés, quelques fragments de poterie, et enfin des armes ou instruments en silex, accusant un style uniforme, une même époque. Rien d'étranger, d'anormal, pas un morceau de métal ne s'y est rencontré.*

Les ossements humains retirés de nos fouilles ont été communiqués au savant anthropologue M. le Dr. Pruner-Bey, qui a bien voulu, avec une rare intelligence, nous communiquer ses conclusions.

Tous nos individus appartiennent à cette race préhistorique que M. Pruner-Bey a baptisée lui-même sous le nom de race mongoloïde. Tous en effet ont la face losangique reconnue comme un des caractères constants de la famille mongole. Ils peuvent se repartir entre quatre types principaux, que M. Pruner-Bey, par son habile diagnose ethnique, rattache aux quatre principaux types des races hyperboriennes. Ce sont : 1° le type lapon à tête arrondie ou brachycéphale ; au squelette grêle et de petite taille ; 2° le type finnois, sur la limite des têtes rondes et des têtes longues, ou mésaticéphale ; au squelette massif et de haute taille ; 3° le type déjà rencontré à la station des Eyzies, que M. Pruner-Bey croit pouvoir rattacher à la race esthonienne, caractérisée par l'allongement considérable du crâne, c'est-à-dire par une dolichocéphalie très-prononcée ; 4° enfin un type particulier jusqu'à présent à Solutré, et que M. Pruner-Bey a nommé esquimoïde, à cause de son affinité avec celui des populations du détroit de Behring. A côté de ces quelques types principaux il faut ranger les métis provenant de leur mélange. Enfin nous ne pouvons passer sous silence un crâne anormal, peut-être celtique, mais qui reste douteux, parce qu'il présente des caractères contradictoires. Notons aussi qu'un certain nombre d'individus présentent des traces de rachitisme.

II.—Nous venons de décrire séparément tous les faits que nous avons eu l'occasion d'observer pendant le cours de nos travaux d'exploration. Il nous reste maintenant à établir les

* Cependant il faut remarquer que vers la partie nord du tertre, la plus rapprochée de la base de l'escarpement, les sépultures sont, pour ainsi dire, à la surface du sol, comme si le terrain de recouvrement avait été enlevé. Dans ce cas, la plupart des squelettes sont bouleversés et leurs débris mêlés à des objets étrangers plus modernes, telles que des briques par exemple. Il y a eu sur ce point remaniement postérieur.

liens qui les unissent entre eux, c'est-à-dire leurs relations et leur concordance.

Nous prendrons pour base et pour point de départ de cette seconde partie le gisement à débris de cuisine et à foyers. Ce gisement représente en effet comme parfaitement homogène, sans trace de remaniements ni de mélanges, ainsi qu'il résulte de la description donnée plus haut. Les dalles qui recouvrent les amas de cuisine ou les foyers, comme d'un sceau intact, seraient là, à défaut d'autres preuves, pour attester que depuis leur abandon, aucune main profane ne vint remuer ces vieilles poussières.

L'espace occupé par ces amas de débris de cuisine est, avons-nous dit, circonscrit en partie par des accumulations particulières d'ossements de cheval, qui, nous l'avons établi, se prolongent au point de contact, sous certains foyers non remaniés. Il n'y a donc pas lieu de douter, les amas d'ossements de chevaux ne peuvent être que contemporains des foyers ou plus anciens qu'eux ; ils ne sauraient à aucun titre être plus modernes. Mais comme après tout il y a une relation évidente entre ces foyers et ces amas de chevaux, comme les uns commencent où les autres finissent et qu'il n'y a aucune confusion des uns aux autres, nous sommes forcés d'admettre qu'ils sont contemporains, ou peu s'en faut. Une même pensée les a créés. Les amas de chevaux bordent l'espace occupé par les foyers, comme un mur borde un chemin. Or il ne viendrait à l'idée de personne, en voyant un mur et un chemin dans cette situation, d'admettre qu'il n'y a entre eux aucune relation intentionnelle.

Si l'on compare les amas de rebuts de cuisine et les amas de chevaux, non plus dans leur position relative, mais dans leur composition intime, on est frappé de leur dissemblance.

Ici sont de vastes accumulations d'os d'animaux divers, renne, cheval, éléphant, cerf, bœuf, etc., tous brisés, mélangés à des matières cendreuse, à des os calcinés, à des silex ouvrés, à des os travaillés. Tout y indique le long séjour d'une population nombreuse ; tout y rappelle les travaux domestiques et les besoins de la vie matérielle ; l'ancien sol est exhaussé progressivement par l'accumulation des débris ; des foyers se sont succédés à la même place ; les uns par dessus

les autres ; de nombreuses esquilles de silex, des nucléi, des pierres cassées, des métaux, indiquent qu'on a taillé longtemps des armes ou des instruments autour de ces foyers. Enfin une quantité énorme d'objets d'utilité ou de curiosité nous laissent deviner une population indigène parfaitement au courant de toutes les productions minéralogiques du pays, comme aussi certaines substances complètement étrangères laisseraient supposer que le champ d'action de cette peuplade n'était peut-être pas seulement limité à la vallée de la Saône, mais qu'il pouvait s'étendre jusqu'aux Alpes. En un mot, les accumulations et débris de cuisine indiquent une alimentation normale, quotidienne, successive, prolongée, alternant avec tous les autres besoins de la vie ordinaire.

Nous ne pouvons tirer les mêmes conclusions des amas de débris de chevaux.

Là, aucun mélange, aucune succession apparente dans leur formation ; on les dirait coulés d'un seul bloc ; partout la même uniformité, partout aussi les mêmes procédés dans cette immense agglomération dont l'unité et la manière d'être suffisent pour écarter l'idée de l'assouvissement d'un besoin matériel. En effet une tribu ne mange pas exclusivement et sans traces d'opérations multiples deux mille chevaux et plus. Nous avons vu dans les véritables rebuts de cuisine une grande variété de débris, et de plus leur accumulation se produire successivement. Si les amas de cheval présentaient quelque chose d'analogue, nous en aurions la preuve dans leur composition même ; rien cependant n'en vient donner l'idée. Ici, tout a été passé au feu ; nul débris n'a été utilisé ; aucun objet étranger ne s'y trouve associé ; pas un os ne présente les stries que produit le silex. En un mot, il y a séparation complète de ces milliers de débris, évidemment mis à part intentionnellement. Il nous est donc impossible de ne pas voir dans les allures si différentes des véritables foyers et des amas de chevaux deux faits bien tranchés : les premiers se rapportant complètement à la vie pratique, usuelle, matérielle ; les seconds, au contraire, ne présentant aucun rapport avec celle-ci.

Les foyers, comme les amas d'ossements de cheval, sont, avons-nous dit précédemment, enfouis à une profondeur

variable sous une couche de terrain remanié, rempli de débris épars analogues soit à ceux des foyers soit à ceux des amas de cheval. Or le Clos du Charnier, cette friche aride et perméable, est éloigné de tout cours d'eau ; il n'y a pas de terres supérieures pouvant s'ébouler ; l'apport annuel y est donc, pour ainsi dire, nul, et il faudrait des siècles de végétation pour augmenter la couche superficielle de quelques millimètres à peine. Si, par conséquent, les amas de débris de chevaux et de cuisine avaient été un beau jour abandonnés à l'air libre, l'action combinée du temps, de la végétation, des hommes, et même des animaux, aurait éparpillé les foyers, dérangé les pierres recouvrantes, désagréé et fusé les os, éraillé ou gelé les silex, altéré la pureté des amas de chevaux, etc. L'eau pluviale elle-même n'ayant pas de terrain supérieur à traverser avant d'arriver sur les débris, et par conséquent pas de matières calcaires à dissoudre, n'aurait pu former les magmas, ni recouvrir comme elle l'a fait d'une couche préservatrice certaines parties des silex, qui lui doivent d'avoir gardé ainsi jusqu'à nos jours leur couleur primitive, couleur qui s'altère parfois en un mois à l'air libre. On ne peut donc hésiter à conclure que les amas, vu leur état et leur admirable conservation, ont dû être enfouis immédiatement, c'est-à-dire dans un bref délai après leur abandon. Cet enfouissement, nous le disions plus haut, ne peut pas être attribué à des causes naturelles ; c'est donc l'œuvre des hommes contemporains des amas et des foyers eux-mêmes.

Tout d'ailleurs nous le prouve, et par exemple la composition même du terrain rapporté. S'il avait été amené là par des causes naturelles, il différerait du terrain vierge sous-jacent et renfermerait des débris plus ou moins roulés et même étrangers à la localité, ou tout au moins au Clos du Charnier. Il n'en est rien ; les ossements répandus dans le sol supérieur sont les mêmes que ceux des foyers et des amas de chevaux, et présentent une conservation identique, sauf ceux qui, exhumés par des causes journalières, gisent çà et là à la surface ; d'où l'on peut conclure que ce terrain est lui-même formé de foyers et d'amas remaniés. De plus, les foyers et les amas sous-jacents étant parfaitement intacts, il faut admettre de toute nécessité que le terrain de recouvrement a

été apporté du voisinage et d'un lieu primitivement occupé par des amas et par des foyers. Peut-être avons-nous dans ce fait l'explication toute simple de la grande dépression orientale dont nous avons parlé précédemment : toute cette portion Est du tertre est, comme nous l'avons fait remarquer, dénudée ; les débris d'ossements y sont très-rares ; et les marnes des lias y sont mises à découverte.

Restent les sépultures.

Elles sont, avons-nous dit, de trois sortes. Occupons-nous d'abord des sépultures entre des dalles brutes. Nous les avons considérées comme contemporaines des foyers, et nous avons dans des mémoires antérieurs développé l'ensemble des preuves qui militent en faveur de cette opinion. Elles peuvent se résumer en trois principales :—1. Plusieurs de ces tombes étaient établies sur des os de cheval pilés et brûlés et sur les amas d'ossements de chevaux. 2. L'une d'elle renfermait des os de cheval, des os de renne et trois couteaux de silex, qui n'avaient pu y être déposés qu'à l'époque de l'inhumation. 3. Enfin les types qu'elles renfermaient étaient mongoloïdes (lapon et finnois) ; identiques à ceux provenant d'autres stations du même âge, et identiques à ceux des foyers voisins, comme l'a déterminé M. le Dr. Pruner-Bey. Il y a donc tout lieu de considérer ces tombes comme contemporaines des amas de cuisine.*

Viennent ensuite les sépultures déposées sur les foyers. Nous avons établi précédemment : 1. Que les squelettes sont invariablement étendus sur les foyers non remaniés, quelle que soit la profondeur de ces foyers. Il serait étrange qu'à une époque postérieure et après l'enfouissement des foyers on se soit fait en quelque sorte une loi d'enterrer par dessus ces foyers, et de creuser les fosses d'inhumation jusqu'à leur rencontre, de façon que certains corps reposant presque à la surface, d'autres se trouvassent enfouis à deux mètres de pro-

* Voir H. de Ferry, Disc. de réception à l'Académie de Mâcon, 1868 ; L'Homme préhistorique en Maconnais, 1868. A. Arcelin, La Station de l'âge du Renne de Solutré, 1868. On s'est étonné de rencontrer des cercueils en laves dès l'âge du renne ; remarquons que s'ils sont rares, la plupart des autres sépultures en sont le *rudiment*. En effet on y retrouve presque toujours soit une pierre levée à la tête du mort, soit quelques pierres levées à ses côtés. N'oublions pas non plus, que les grottes funéraires du Trou de Furfooz et d'Aurignac étaient fermées par une dalle levée.

fondeur. 2. Qu'un grand nombre des os des squelettes portent des traces de brûlure. Ce fait vaut une étiquette, et prouve d'une façon irréfutable que les corps ont été déposés sur les foyers mal éteints ou au moins encore chauds, avant leur enfouissement par conséquent ; ce qui indique en même temps la cause de cet enfouissement et la raison de ce terrain rapporté. Il fallait bien recouvrir et protéger les morts dans leur dernier sommeil. 3. Que les types sont tous mongoloïdes, identiques, pour un certain nombre, à ceux des tombes en dalles brutes, et présentent le même degré d'altération et les mêmes incrustations calcaires, le même aspect bleuâtre et crayeux des os. La conclusion à tirer de cela est que les sépultures des foyers sont contemporaines des foyers, et contiennent des ossements identiques à ceux des sépultures en dalles.

Il en est de même des sépultures qui ont été faites simplement dans le terrain libre ; elles ont donné des types identiques aux premiers, et si l'on observe que nous avons toujours trouvé étendu sous le cadavre, comme un petit lit d'os ou de charbon, lui formant comme une chape funèbre, on n'hésitera pas à les assimiler aux autres, et à considérer la nécropole du Clos du Charnier comme parfaitement homogène.* En un mot, nous concluons, sous la dictée des faits, que foyers, amas de débris de cuisine et d'ossements de cheval, sépultures en dalles brutes, sur des foyers ou dans le terrain libre, sont unis par un lien intime et incontestable ; et nous nous croyons autorisés à établir les propositions qui suivent.

1. Des foyers ont été formés sur le sol primitif d'un tertre naturel.

2. Un grand nombre d'animaux, parmi lesquels le renne domine, ont été dépecés, cuits (et mangés selon toute apparence crus ou cuits) autour de ces foyers.

3. Des silex ont été taillés sur place.

* Quand les sépultures ne sont ni sur les *magma* de chevaux ni sur les débris de cuisine, mais simplement dans la terre libre, le mort repose toujours sur un lit cendreuse qui le périmètre exactement. Autour et au-dessous règne le terrain vierge ; ce qui prouve bien que les squelettes et la chape cendreuse sont du même temps, parce que cette relation des niveaux si constante ne peut pas être accidentelle. Ici comme ailleurs les os portent toujours des traces de brûlure, comme si le corps avait été déposé sur un petit foyer allumé à son intention.

4. Ces opérations ont duré longtemps, et ont dû se renouveler fréquemment au même lieu (foyers superposés) ; tout y indique les traces d'un long séjour.

5. Des débris de cuisine ainsi que des bois de renne, brisés intentionnellement, et des silex taillés, ont été accumulés sur certains points et recouverts de dalles brutes.

6. Une immense quantité de chevaux ont été égorgés, dépecés, cuits, brûlés, et leurs débris amoncelés autour de l'espace occupé par les amas de rebuts de cuisine et les foyers ; quelques foyers même ont été établis et allumés sur ces amas de chevaux brûlés.

7. Des morts, paraissant appartenir à la race mongoloïde (types finnois, lapon, esthonien et esquimaux), ont été déposés sur ces foyers encore chauds.

8. Le tout a été recouvert dans un bref délai de terre ramassée alentour à la surface du sol et contenant de nombreux débris de foyers dispersés ; puis l'espace a été nivellé ou à peu près.

Tel est le rigoureux enchaînement des faits.

III.—Nous avons terminé l'examen scientifique de la station du Clos du Charnier. Les faits sont établis avec toute la précision qui nous a été possible. Les éléments du problème sont définis. A chacun maintenant d'en tirer les conclusions qui lui paraîtront les meilleures, et de les expliquer comme il lui plaira.

Qu'on nous permette néanmoins d'exposer, pour finir, les hypothèses que nous a suggérées cette étude longue et patiente, poursuivie sans interruption pendant deux années, et pendant laquelle nous avons cherché à nous identifier aux allures, aux mœurs, aux usages, à la vie en un mot, des gens dont nous venions remuer la poussière.

Il nous paraît constant que le Clos du Charnier et les lieux environnants, ont servi de campement à une tribu mongoloïde de l'âge du renne. Était-ce un campement permanent ? Nous ne le pensons pas, parce que des peuples chasseurs sont nécessairement obligés à de nombreux déplacements ; ce qui ne les empêche pas d'ailleurs de revenir souvent aux mêmes lieux, suivant les saisons, les hasards de la chasse, etc. Solutré fut donc tout au moins une station de chasse fréquemment

et longtemps visitée ; de telle sorte que, en maintenant la réserve que nous venons de faire, on pourrait à la rigueur la dire permanente. Nous avons déjà démontré dans des travaux antérieurs, en nous appuyant sur l'opinion des savants les plus compétents en pareille matière, MM. Édouard Lartet, Dupont, de Mortillet, etc., que la station de Solutré peut être de tout point assimilée à celle de Laugerie Haute, c'est-à-dire rapportée à la première époque du renne, antérieure aux stations de la Madelaine, des Eyzies et de Bruniquel.* Les faits servant à l'établir sont de deux sortes : les uns positifs—la forme, le style, et le travail des silex ; les autres négatifs—l'absence de hachettes, de scies, de flèches ou d'aiguilles en os, l'extrême rareté d'instruments en os et d'objets d'art ; la rareté relative des couteaux.

A ceux qui, poussés par une curiosité peut-être trop hâtive, nous demanderont de fixer la date chronologique de notre station, nous nous contenterons de répondre par un minimum approximatif. Des études sur les alluvions de la Saône † nous ont en effet permis de constater que l'époque de la pierre polie, postérieure à celle du renne, a commencé à régner dans nos pays depuis 4000 ou 5000 ans au moins. L'époque du renne serait donc plus ancienne. Les premières traces que nous ayons cru en retrouver en remontant le cours des siècles, c'est-à-dire en pénétrant dans les alluvions de la rivière, paraissent correspondre à des marnes bleues, auxquelles il nous est impossible d'attribuer, vu leur niveau, moins de 8000 ou 10,000 ans. Entre ces marnes bleues et l'époque de la pierre polie nous n'avons que des preuves *négatives* : aucun produit caractéristique n'est venu encore affirmer une civilisation déterminée.

La bonne exposition du coteau de Solutré en plein midi ; le voisinage du rocher, citadelle naturelle et inexpugnable ; la proximité d'une source abondante ; une vue étendue en tous sens, et enfin une situation des plus avantageuses pour

* H. de Ferry, *L'Homme préhistorique en Mâconnais*, 1868. A. Arcelin, *La Station de l'âge du Renne de Solutré*, 1868. G. de Mortillet, *Matériaux pour l'Histoire positive et philosophique de l'Homme*, t. iv. pp. 36, 108.

† A. Arcelin, *Les Berges de la Saône*, 1868. H. de Ferry, *Les Gisements archéologiques des bords de la Saône*, 1868.

l'époque, ont pu déterminer les sauvages chasseurs de renne dans le choix de leur campement favori.

D'après les observations précédemment décrites, nous avons cru devoir établir une distinction radicale, entre deux ordres de faits que nous nous sommes appliqués à caractériser et à différencier dans les chapitres précédents.

D'une part, nous voyons des foyers, des amas de rebuts de cuisine, d'armes et d'instruments, se rapportant aux usages domestiques et à la vie matérielle.

De l'autre nous trouvons des foyers funéraires avec leurs hôtes, et des accumulations d'ossements de chevaux qu'il est impossible de confondre avec des débris de cuisine ordinaires. Plus de 2000 chevaux égorgés à la fois, dépecés, brûlés, enfouis tous ensemble, à part, sans mélanges de débris étrangers—seraient-ce donc là les restes d'un festin ? La raison et le bon sens se refusent à le croire. Qu'est-ce alors ? Si l'on tient compte du grand nombre de sépultures exhumées du même lieu, on est conduit à voir dans cette accumulation de chevaux l'accomplissement de rites funéraires.

Nous avons dû nous arrêter à cette interprétation, n'en pouvant trouver d'autre plus plausible.

Ici le campement de la tribu, là sa nécropole. Et pourquoi pas ? Si de nombreuses générations ont vécu en ce lieu, on a dû y mourir aussi ; et si l'on s'étonne de rencontrer sur un point tant de sépultures d'une si prodigieuse antiquité, ne serait-on pas bien plus surpris encore de n'en trouver aucune ?

Entre les foyers ordinaires et les foyers funéraires proprement dits, la différence n'est pas nettement tranchée. Si d'une part il y a de petits foyers, formés selon toute évidence à l'occasion et en l'honneur des sépultures, il y en a d'autres qui par leur importance, leur épaisseur, la variété des débris qu'ils contiennent, semblent n'avoir été transformés en foyers funéraires, proprement dits, qu'après avoir servi d'abord aux usages vulgaires de la vie ordinaire. Peut-être à cette époque, comme encore aujourd'hui chez certaines peuplades sauvages, l'usage existait-il d'enterrer les morts dans la hutte même et sous le foyer domestique.

Quoi qu'il en soit de ces points de détail, le Clos du

Charnier—il nous paraît impossible d'en douter—fut le lieu d'un campement considérable, d'une station de chasse très-fréquentée, transformée à un moment donné, et selon toute apparence successivement, en un grand tertre funéraire qui nous révèle tout un horizon nouveau, en nous initiant aux rites funéraires des hommes de l'âge du renne, à leurs préoccupations morales, et—qui sait ?—à leur croyance dans une autre vie.

Tout est relatif ; et si l'on tient compte des temps, des ressources, des moyens, on est profondément surpris des prodigieux efforts consacrés sur ce point à une idée toute morale, dégagée des besoins pressants de la vie matérielle. Qu'on réfléchisse, en effet, aux difficultés que présente le seul enfouissement des foyers et des sépultures sous une épaisseur d'un ou deux mètres de terre rapportée, pour des hommes qui n'avaient ni pelles, ni pioches, ni instruments de métal ! De tels faits, quelque barbares et primitifs qu'ils soient, affirment hautement le respect et le culte des morts.

On pourra nous objecter que cette hécatombe de chevaux que nous signalons comme un rite funéraire est un fait nouveau et qu'on n'a pas observé encore à l'âge du renne. Nous répondrons à cela, que l'ethnographie de l'âge du renne est actuellement basée sur un trop petit nombre de documents pour qu'on puisse rejeter un fait sous prétexte qu'il n'a pas été encore observé. Il est bon d'ailleurs de se souvenir, qu'aux temps historiques les Aryens primitifs d'une part, et les peuples mongols de l'autre, immolaient des chevaux sur les tombes des morts. Cet usage pouvait remonter très-haut dans le passé.

Nos foyers funéraires ne peuvent donner lieu aux mêmes réserves. En beaucoup d'autres stations on les a retrouvés plus ou moins bien caractérisés. ' Dans la dernière sépulture humaine, fouillée aux Eyzies par mon fils,' nous écrivait dernièrement M. É. Lartet, ' il se trouvait *au-dessous* plusieurs foyers superposés, avec débris de cuisine. Nous avons également trouvé à la Madelaine les restes d'un squelette humain à côté d'un foyer à débris de cuisine.' Les ossements humains découverts par M. Brun au gisement de Lafaye (Bruniquel) se sont présentés dans les mêmes circonstances, c'est-à-dire entre des foyers et au milieu de débris de cuisine. La

fameuse grotte funéraire du Trou de Furfooz (Belgique), explorée par M. Dupont, et celle d'Aurignac (Haute-Garonne), explorée par M. E. Lartet, étaient également accompagnées de débris de cuisine et de foyers funéraires, ces derniers placés non pas sous les cadavres, mais à l'entrée des grottes. Remarquons en passant que l'ensevelissement dans des grottes est un fait local, accidentel, sur lequel il serait imprudent de conclure à des généralités.

Mais il demeure constant (sauf les exceptions probables) qu'à l'âge du renne, l'ensevelissement se faisait dans des amas de débris de cuisine et sur des foyers. On n'a pas assez insisté sur ce point, qui d'ailleurs ne ressortait peut-être pas assez clairement des faits isolés précédemment recueillis. La station de Solutré paraît ne devoir laisser aucun doute à cet égard.

La vie devait être au Clos du Charnier celle de tout peuple de guerriers et de chasseurs. L'absence d'objets d'art ou leur extrême rareté prouve bien qu'on y avait peu de loisirs. Mais après tout les hommes de la tribu ne manquaient ni d'instinct ni d'aptitude naturelle pour les travaux artistiques. Quelques essais abandonnés sur place, comme pour témoigner en leur faveur, le prouvent surabondamment. Mais il fallait vivre d'abord ; et il fallait sans trêve ni repos battre la prairie et la forêt. L'abondance des armes, la perfection et le soin apportés dans leur taille, prouvent bien que les travaux de la chasse ou de la guerre dominaient toute autre préoccupation. Cependant, il semble que les mœurs étaient au demeurant assez douces. Le respect des vieillards, chose si rare parmi les peuples barbares, suffirait à le prouver. Les sépultures abondent, comme nous l'avons dit, en squelettes d'individus fort âgés, privés de toutes leurs dents, assurément incapables de pourvoir eux-mêmes à leur existence, et qu'il fallait nourrir de moelle, de sang, ou de cervelle. N'est-ce pas là un fait bien remarquable quand chez la plupart des peuples barbares connus aux temps historiques, le meurtre ou le suicide des vieillards étaient passés en usage général ? Peut-être ne serait-il pas inutile de rappeler ici que les Indiens de l'Amérique du Nord, appartenant eux aussi au grand tronc mongoloïde, tenaient les vieillards en haut respect, et qu'ils ne

tombèrent jamais à leur égard dans les honteuses aberrations des peuples aryens du continent européen.

Cependant nous devons déclarer que l'examen de quelques foyers nous a inspiré des soupçons de cannibalisme. Assez souvent nous y avons retrouvé des ossements humains brisés comme les os à moelle de renne, et mêlés aux débris et rebuts de cuisine. Mais peut-être n'étaient-ce que les restes de sépultures bouleversées.

Nous avons observé la rareté des dents de carnassiers et de grandes bêtes parmi les débris du campement, et nous en avons conclu que les habitants primitifs de Solutré n'avaient pas de goût pour la chasse dangereuse, et préféraient à l'honneur périlleux de mettre à mort un tigre, un ours, un loup, la poursuite presque exclusive du renne et du cheval. Cela est si vrai, qu'au lieu de ces colliers de dents de grandes bêtes, glorieux trophée de victoires qu'on trouve dans d'autres stations, nous n'avons rencontré au Clos du Charnier qu'une dent de loup et une dent de renard percées d'un trou de suspension ! Et cependant il y avait du tigre et probablement aussi de l'ours et de la hyène dans la montagne ; du grand bœuf, du grand cerf, et de l'éléphant dans la plaine.

On savait vraisemblablement préparer les peaux pour en faire des vêtements. L'abondance de grattoirs en silex, semblables à ceux qu'emploient encore aujourd'hui les Esquimaux pour cet usage, l'indiquent suffisamment. Connaissait-on l'art de les coudre ? Peut-être, puisque nous avons retrouvé quelques poinçons en os ou en pierre. Mais à coup sûr l'aiguille était ignorée à Solutré. C'est un peu plus tard seulement, au temps de La Madelaine, des Eyzies, et de Bruniquel, qu'elle fut employée.

On pourrait, des faits précédemment exposés dans ce mémoire, tirer à l'infini des déductions ethnographiques d'un certain intérêt. Cela nous entraînerait trop loin et bien au delà du cadre que nous nous sommes tracés. Nous laissons donc ce soin à nos lecteurs, notre but étant simplement de décrire l'état des lieux et de le livrer autant que possible sans commentaire à l'examen et aux méditations des hommes compétents.

Cependant nous ne voulons pas finir sans résumer en

quelques mots la question anthropologique, telle qu'elle se présente par suite des révélations du Clos du Charnier, et telle que nous la considérons.

Comme nous l'avons dit, tous les squelettes humains recueillis, au nombre de cinquante environ, pendant le cours de nos fouilles, semblent appartenir, à l'exception d'un crâne douteux, à la race mongoloïde et aux types hyperboréens. Ne serait-ce point là une précieuse confirmation de l'opinion soutenue par M. le Dr. Pruner-Bey, à savoir que la race mongoloïde s'était, dès l'époque du renne et même antérieurement, étendue sur toute l'Europe occidentale ? A Solutré, comme au Trou de Furfooz, comme à La Naulette, à Rosette, à Arcy-sur-Eure, à Bruniquel, aux Eyzies, et même comme à Aurignac et à Moulin-Quignon (?), tout est mongoloïde, et appartient à des types identiques ou très-voisins. L'authenticité de ces débris ne peut pas être douteuse. Leur nombre déjà assez considérable en est la garantie ; et non-seulement il y a entre eux uniformité de types, mais ils se sont généralement trouvés dans les mêmes conditions archéologiques, au milieu des stations qui les datent, couchés sur des amas de débris de cuisine et sur des foyers, etc.

Restent, il est vrai, le crâne prétendu celtique d'Eguisheim provenant du loess quaternaire de la vallée du Rhin, et le crâne douteux de Solutré.*

Malheureusement, ce crâne d'Eguisheim est privé de sa face, et ne fournit par conséquent qu'une indication incomplète. Quant au crâne de Solutré, il offre des caractères contradictoires—comme, par exemple, une extrême dolichocéphalie jointe à une enflure considérable des tempes et des arcs zygomatiques, ce qui donne à la face une largeur qui n'est certes point celtique. Cependant par son nez osseux et la forme des orbites, l'ensemble de la face se rattache à cette race. M. Pruner-Bey, qui l'avait d'abord classée comme celtique, a cru devoir, après un nouvel examen, suspendre provisoirement

* L'un de nous, dans un travail antérieur (A. Arcelin, *La Station préhistorique de l'âge du Renne*, p. 19) a considéré ce crâne comme postérieur à la station, et se rapportant à l'âge de la pierre polie. Il y avait été conduit : 1° par le diagnostic de M. Pruner-Bey ; 2° par la présence de poteries d'aspect néolithique ; 3° par le remaniement apparent des foyers adjacents. Mais depuis, comme il a été dit ci-dessus, M. Pruner-Bey a modifié ses conclusions ; de plus de la poterie

tout jugement à ce sujet. Jusqu'à plus ample information, l'importante question de l'arrivée des Celtes dans nos pays reste donc encore obscure et irrésolue. 'Il est certain,' nous écrit M. Pruner-Bey, 'qu'ils y sont à l'âge de la pierre polie; il est probable qu'ils y étaient déjà avant; il est possible qu'au moins quelques-uns de leurs ait donné de son sang déjà aux contemporains du renne.'

En résumé, le Clos du Charnier nous a fourni des hommes parfaitement dignes de ce nom, bien constitués, les uns petits et frêles, les autres de grande taille et robustes; quelques-uns offrant des traces de rachitisme. Sous le rapport crânien ils paraissent présenter, outre les caractères généraux de la race mongoloïde, les types déjà bien accentués des peuples hyperboréens actuels, finnois, lapons, esthoniens, esquimaux; les uns sont brachycéphales, les autres mésaticéphales, d'autres enfin franchement dolichocéphales.

Telles sont pour le moment, et jusqu'à nouvel ordre, les conclusions et les réserves auxquelles nous sommes forcés de nous en tenir.*

H. DE FERRY.

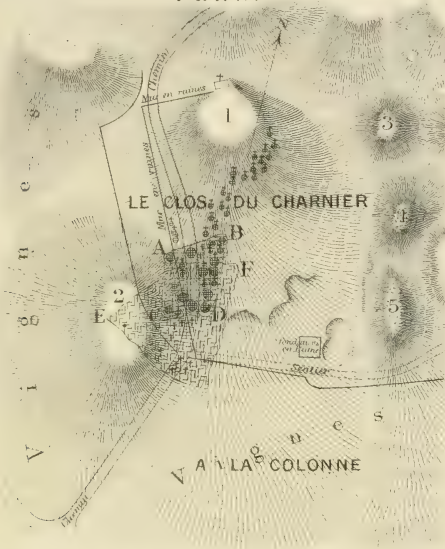
A. ARCELIN.

semblable à la première fut trouvée en place dans des foyers non remaniés; et enfin, le remaniement des foyers adjacents au prétendu Celte n'était qu'apparent, comme l'a démontré la suite de nos opérations. Ce squelette reposait sur le magma de cheval, entre des accumulations de débris de cuisine, protégé par quelques dalles brutes levées, c'est-à-dire *absolument* dans les mêmes circonstances que tous les autres, dont il est impossible de le séparer.

* Les auteurs de ce mémoire ont cru devoir, vu l'état actuel de la science, et pour des considérations qu'il serait trop long de développer ici, adopter l'opinion d'un de nos plus habiles anthropologues, M. le Dr. Pruner-Bey. Mais ils produisent ces conclusions sous toutes réserves, comme des conclusions personnelles, et ne prétendent en aucune façon les donner comme des résultats *acquis* à la science. On sait, en effet, que les anthropologues, d'accord sur les faits et sur l'analyse, sont loin de s'entendre pour la synthèse, et que notamment la caractéristique des races humaines est encore l'objet de vives discussions et d'opinions contradictoires.

H. DE F. A. A.

LES FOUILLES DU CLOS DU CHARNIER. P L A N.



- A B C D Espace occupé par les débris & amas de rebuts de cuisine
 E F G Espace occupé par les accumulations d'ossements de chevaux
 1 Sépultures.
 2 Grand tertre.
 3 Puits tertre.
 4, 5 Amas de pierres brutes.

Mètres 0 10 20 30 40 50 60

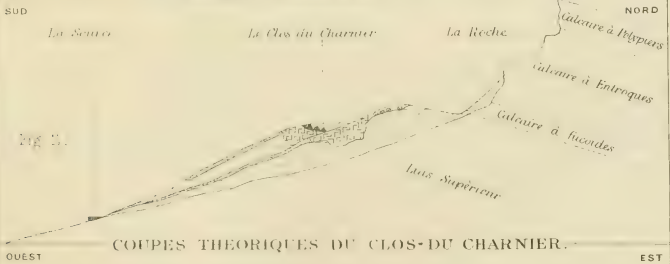
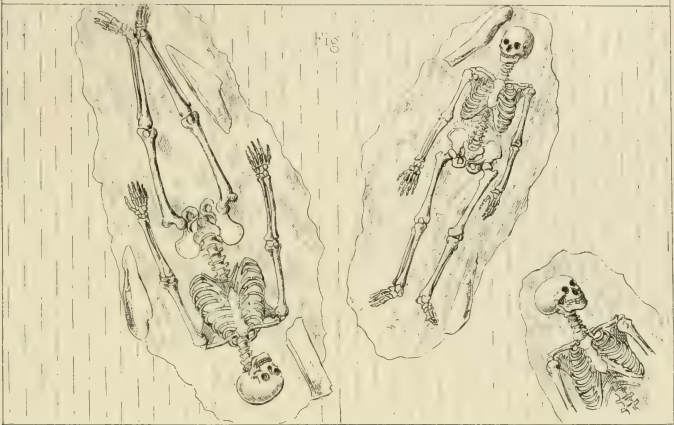


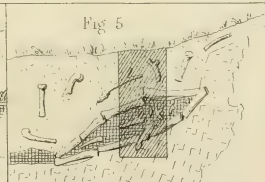
Fig. 3.



SQUELETTES ETENDUS SUR DE PETITS LITS D'OS BRULÉS ET
DE CENDRE FORMANT CHAPES FUNÉRAIRE.



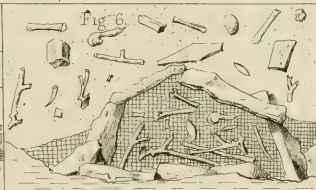
COUPE DU TERRAIN.



FOUILLE DU 12 JUIN 1868.

EXPLICATION DES SIGNES.

Terrain Remanié
Terrain Remanié avec
debris de l'âge du Reine
Debris de cuisine
et foyers.
Accumulations d'osse-
ments de chevaux.
Terrain Vierge
(Terrain d'Eboulement.)



COUPE D'UN FOYER.

CLOS DU CHARNIER.

MONUMENTS MÉGALITHIQUES DU DÉPARTEMENT DE L'AVEYRON.

PAR M. ÉMILE CARTAILHAC.

MONSIEUR LE PRÉSIDENT,—Ne pouvant assister au Congrès, je voudrais néanmoins prendre à ses travaux une part, très-humble et très-faible malheureusement. Je me suis occupé d'une manière spéciale des monuments mégalithiques dans le midi de la France, et surtout dans l'Aveyron, qui est un de nos départements les plus riches en antiquités préhistoriques ; et l'an dernier à Paris je communiquais au Congrès anthropologique les principaux résultats de mes fouilles dans une trentaine de dolmens, et les conclusions qui me semblaient pouvoir en être déduites. Cette année je viens à peine de recommencer mes recherches, et rien n'est encore venu infirmer les quelques vues générales ou particulières que je m'étais permis d'émettre dans une note qui fait partie du volume des procès-verbaux.

En ce moment je fouille une longue allée couverte, ou mieux une suite de dolmens qui se touchent dans le sens de l'orient à l'occident, orientation qui n'est pas constante dans notre pays. Nous avons même un beau dolmen qui est dirigé N.S. Cette allée couverte de *Taurines* (Arrondissement de St.-Affrique, Aveyron) est en grande partie ruinée, soit par l'action de l'homme, soit par d'autres causes. Les corps non brûlés y sont très-nombreux, mais les ossements sont presque tous brisés, ou du moins très-friables. Ça et là quelques dents, quelques phalanges carbonisées attestent que la minorité des cadavres avaient subi une incinération fort incomplète. J'ai pu reconnaître les restes d'individus de tout âge ; les dents sont moins usées que dans les autres dolmens.

Il y a des ossements de brebis et de bœuf, mais ils ont été portés là par les bêtes sauvages ; et presque tous nos dolmens étant plus ou moins en ruine et ouverts, il serait

imprudent de tirer la moindre conclusion de la présence dans leur chambre sépulcrale d'ossements d'animaux sauvages ou domestiques.

La planche I, ci-jointe, qui représente de grandeur naturelle les principaux objets trouvés dans cette sépulture, vous donnera une idée exacte du mobilier funéraire des monuments mégalithiques du midi de la France.

Fig. 1 à 5, pointes de flèches en silex blanc ou gris, taillées avec un soin fort remarquable.

Les fig. 6 et 7 donnent les dimensions extrêmes de petites perles en jais ou lignite compacte.

Fig. 8, 9, 10, 11, perles ou pendeloques en coquille de *Cardium*.

Fig. 12, 13, 16, 17, 22, perles en calcaire.

Fig. 15, perle longue en jais ou lignite compacte.

Fig. 18 à 21, perles en *buis*.

Fig. 23, 24, 25, perles en bois (*buis* ?) assez curieuses à cause de leur forme.

Fig. 16, dent canine de chien percée d'un trou, et destinée à orner un collier.

Fig. 14, *patelle* percée d'un trou.

Fig. 28, perle en bronze.

Fig. 30 et 31, annelets en bronze.

Fig. 29, annelet double en spirale.

Fig. 27, pendeloque en bronze. Cette pièce, calquée évidemment sur la forme de la dent de carnassier, fig. 26 (ornement déjà fort ancien comme on sait), aussi bien que les pendeloques (fig. 9 et fig. 6, planche VI) en coquille ou en calcaire schisteux, confirme à merveille ce que j'ai avancé à diverses reprises : ' Dans nos pays (Aveyron et départements voisins), le bronze, encore assez rare et précieux, n'est employé qu'en petites quantités, pour les bijoux à peu près exclusivement, et la plupart copient les perles longues ou les pendeloques en pierre à un point qui ne peut laisser planer aucun doute sur le fait que les hommes des dolmens à l'apogée de l'industrie de la pierre polie font pour la première fois usage du bronze qu'ils n'avaient pas d'ailleurs inventé.'

Planche II contient les dessins des principaux objets de bronze, ou de ceux qui se rencontrent fréquemment dans les tombeaux mégalithiques de notre pays.

Fig. 1, 2, 3, petites plaques fort minces, percées de petits trous, et destinés sans doute à être cousus sur des vêtements. (Voir Keller, 'Pfahlbauten,' 6^e Rapport; Taf. xvi. 5.)

Fig. 4 et 6, perles longues en bronze calquées sur la forme de celles en pierre, pl. 6, fig. 4 et 5, qui sont très-communes.

Fig. 5, petite plaque roulée en forme de tube.

Fig. 7, 8, 9, 10, perles de diverses grosseurs.

Fig. 11, 12, 13, 14, 15, anneaux et annelets.

Fig. 18, fil de bronze enroulé en spirale.

Fig. 16, bracelet fort bien exécuté avec spirales et double hélice comme ornements, gravées en creux.

Fig. 17, grand anneau ouvert—bracelet (?).

Fig. 19, pendeloque. Au premier abord je l'avais prise pour un ardillon de boucle, quoique la lame fut extrêmement mince et mal faite pour cet usage. De plus, je n'avais pas trouvé le moindre vestige de la boucle. Il existe au Louvre un beau collier égyptien composé de petites perles uniformes; la monotonie des lignes est coupée par de petites breloques *identiques* à la nôtre! Cette pièce de bronze serait donc une pendeloque comme je l'ai indiqué en lui adjoignant sur le dessin plusieurs petites perles.

Enfin dans la même planche, fig. 20 et 21, j'ai représenté deux petites plaques en fer percées, que nous possédons au Musée d'Histoire Naturelle, et sur lesquelles j'ai cru nécessaire de dire quelques mots.

Dans son rapport adressé à M. le Ministre de l'Intérieur Belge, M. Scheuermans écrit: 'Il est incontestable jusqu'ici, que jamais, en Europe, le moindre fragment de fer n'est sorti du tréfonds d'un dolmen.'

Dès 1865 j'avais trouvé des fragments de fer, tout-à-fait informes, et sur le conseil de M. de Mortillet je n'en parlai pas, sinon pour en faire une preuve du remaniement ou de la violation de la sépulture primitive à une époque plus ou moins récente, ce qu'indiquaient aussi quelquefois des tessons de poterie grise ou rougeâtre égarés parmi les fragments bien authentiques en pâte grossière parsemée de grains de sable ou de calcaire pilé.

Mais en 1866, Monsieur l'abbé Cerès, notre confrère de la Société des Lettres, Sciences et Arts de l'Aveyron, ayant fouillé

avec un soin minutieux plusieurs des nombreux monuments funéraires du nord du département, recueillit des perles plates en fer dans deux dolmens.

1. Dans un beau tumulus était caché un dolmen (ce qui est rare chez nous) ; sur la table qui recouvrait la cavité sépulcrale on trouva une épaisse couche de cendres mêlées à des pierres calcinées et à des ossements à moitié consumés, plus un grand nombre de dents et autres ossements de chien, des fragments d'anneaux en bronze assez minces, des grains de collier en fer. Dans l'intérieur du dolmen il n'y avait que des objets en pierre.

2. Dans un autre tombeau on trouva pêle-mêle des pointes en silex, quelques morceaux de bois de cerf travaillés au moyen d'un instrument tranchant, des tessons de poterie grossière, quatre morceaux de fer informes dont un percé d'un trou, et une centaine de grains de collier en calcaire, jais, coquille, os, *bronze* et *fer* ; ce sont deux de ces grains de fer que j'ai dessinés, et après un examen attentif je ne doute pas qu'ils n'aient été associés aux autres annelets dans les mêmes parures. Ce fait est fort important, et s'il était admis sans contestation il faudrait presque renoncer à l'âge du bronze dans notre Aveyron, puisque les hommes des dolmens y auraient vu l'aurore non seulement de l'âge du bronze, mais encore, peu de temps après, de l'âge du fer. Il est de fait que les objets en bronze sont extrêmement rares chez nous, et les musées en possèdent bien peu. Quoiqu'il en soit, je crois qu'il ne faut pas laisser tomber dans l'oubli la trouvaille de M. l'abbé Cerès qu'il a communiquée, mais sans se douter de l'intérêt qu'elle présentait, au Congrès des sociétés savantes, Paris, 1866. (Rapport sur quelques Dolmens et Tumuli des environs de Rodez.) Je n'en dirai pas plus long sur le bronze et le fer dans nos monuments. Depuis le dernier congrès mes idées ne se sont pas modifiées, et je demeure persuadé que s'il n'y a pas de bronze dans les tombeaux de pierre brute du nord, c'est que les hommes des dolmens ne le connaissaient pas encore ; que si exceptionnellement on y trouve de beaux ornements et des armes parfaites en métal, dans des cas où le remaniement est impossible à invoquer, ces armes, ces parures venaient de chez un peuple étranger

avec lequel des relations suivies ne devaient s'établir que bien plus tard, lorsque le peuple des dolmens arrive dans le midi de la France. Nous trouvons chez nous toutes les preuves désirables établissant que la pierre va enfin céder la place au métal; c'est un fait mis hors de doute, et duquel on peut tirer toutes les conséquences possibles.

En terminant j'insisterai sur un autre fait intéressant. Dans nos dolmens la hache en pierre, si commune dans les champs, dans les grottes, ne se rencontre presque jamais. On trouvera planche 6 le dessin de trois petites haches, en jaspe, en ophite et en serpentine. La première provient certainement d'un dolmen. J'ai signalé ce fait dans la note lue au Congrès de l'année dernière, mais je n'avais pas encore à cet époque un dessin de cette petite hache. La seconde viendrait d'un dolmen du Tarn-et-Garonne (?); enfin, la troisième a été trouvée par mon ami, M. Ancessy, dans la Grotte de St.-Jean-d'Alcas, ossuaire de l'époque des dolmens, où les pointes de flèches, les perles, etc., abondaient, et d'où on n'a retiré que trois haches, ou quatre au plus; deux sont dans la collection de M. Cazalis de Fondouce.

Les haches sont donc fort rares dans les dolmens; de plus elles sont très-petites, et je me demande si véritablement nous n'avons pas là des amulettes ou symboles plutôt que des instruments de cuisine ou d'industrie.

Les haches sont très-communes en dehors des dolmens; il n'y a pas de paysan qui n'en ait quelqu'une précieusement cachée; et tous les jours on en trouve dans les champs. Rarement, il faut l'avouer, elles sont aussi belles que celles des dolmens de Bretagne ou du Danemark. Il y a peu de temps notre musée en a obtenu trois qui peuvent cependant rivaliser avec celles-ci; plates et fort longues, taillées à petits éclats en pétro-silex.

Les autres planches (III-VII) que je joins à cette note représentent quelques monuments récemment découverts que nous allons explorer avec soin. Dolmens avec cromlechs, pl. V, VI; et dolmens d'une forme toute particulière, pl. VII. Les planches III et IV représentent les types des dolmens les plus répandus.

S'il m'était permis, j'exprimerais un vœu: celui de réunir,

comme appendice au volume de compter-rendus que vous publierez, une nomenclature, *un catalogue détaillé* des principaux livres, brochures ou mémoires, publiés à part ou dans les recueils des sociétés savantes, touchant les matières qui font l'objet des études du Congrès. Ce catalogue détaillé que ferait chaque nation à son tour, serait certainement, pour les travailleurs étrangers, une révélation, non pas précisément pour l'Angleterre, car nous savons à peu près quelles sont vos richesses; elles nous ont été révélées par votre ouvrage si beau et si nécessaire, de *L'Homme avant l'Histoire*; mais dans tous les cas, et surtout pour ceux qui veulent étudier à fond certaines parties de la science, cet inventaire serait un auxiliaire bien précieux.

Je n'émetts ce désir qu'après l'avoir vu partagé par plusieurs de nos confrères. Si vous jugez, Monsieur le Président, qu'il ait quelque chance d'être accueilli par le Congrès, soyez assez bon pour le produire soit sous mon nom, soit de la façon qui vous paraîtra la meilleure.

Veuillez agréer, Monsieur le Président, avec tous mes remerciements d'avance, l'expression de mon respect.

Votre très-humble confrère.

ÉMILE CARTAILHAC.

The following communication has been since received from MM. Cartailbac and Trutat :—

Nous avons résolu de publier un Rapport annuel sur toutes les découvertes et tous les travaux écrits, touchant la question de la haute antiquité de l'homme et de l'homme préhistorique. La paléontologie et la géologie, l'archéologie et l'ethnologie sont, comme on sait, les sciences spéciales auxquelles l'anthropologie proprement dite doit faire appel pour arriver à mettre parfaitement en lumière l'histoire primitive de l'humanité. Nous sommes prêts à donner à notre idée toute son extension, à son exécution matérielle toute la largeur possible. Notre œuvre sera en rapport d'ailleurs avec le champ d'information. C'est aux personnes occupées de ces questions à vouloir bien nous aider dans un intérêt commun.

Nous pouvons fort bien résumer les volumes et les brochures

qui, certes, ne manquent pas. Nous avons de plus entre les mains, les annales de toutes les sociétés savantes de France, un certain nombre de l'étranger et les publications périodiques; mais cela n'est point assez. Nous voulons, en effet, joindre à notre texte purement descriptif des dessins sur toutes choses: coupes de terrains; ossements remarquables; objets d'industrie (armes, outils, parures, etc.); cartes géographiques et autres; plans et vues de grottes, stations, sépultures, etc. C'est par là que notre œuvre se recommande à l'attention des travailleurs. Toutes les notes qui nous seront transmises avec des dessins, des photographies, et surtout des moulages, seront accueillies avec reconnaissance. Si notre premier volume contenait 500 gravures, l'avenir de notre publication serait assuré.

A l'exposé méthodique et impartial des découvertes et des travaux, nous ajouterons des renseignements complets et précis sur le contenu des divers musées, à notre point de vue. C'est surtout pour ce répertoire, que de nombreux dessins sont indispensables. Enfin, nous terminerons par des biographies.

Les derniers mois de 1867 sont notre point de départ. Plus tard, il nous sera permis peut-être de publier des rapports rétrospectifs. D'un autre côté, la limite extrême sera le mois de décembre 1868, pour le premier volume, qui doit paraître avant le prochain Congrès d'Anthropologie et d'Archéologie Préhistorique.

Nous n'avons pas entrepris ce travail, sans avoir reçu les encouragements et les conseils des hommes les plus compétents, et aussi des promesses de collaboration déjà en partie réalisées. Les avis de tous seront encore les bienvenus.

Un mot, maintenant, sur une objection prévue. Notre publication ne peut rien perdre à avoir son siège en province et non à Paris. Au contraire: nous sommes à Toulouse, au centre d'une région classique: Bise, Pondres, Souvignargues, Nabrigas, Bruniquel, le Périgord, les Pyrénées et leurs grottes innombrables, l'Infernet et Venerque, Aurignac enfin, sans parler des monuments mégalithiques, des gisements importants de l'âge du bronze, des tumuli.

Les collections municipales de Toulouse sont tenues au

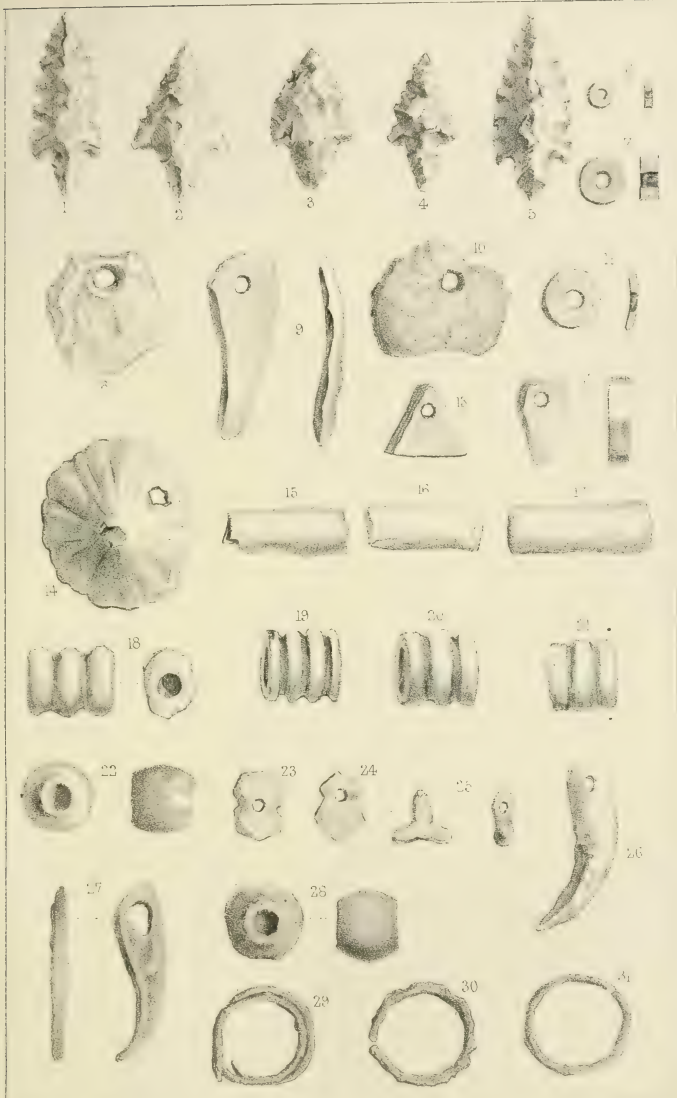
courant par des dons nombreux et des fouilles continuelles. Le regrettable Falconer, MM. Lartet et Cotteau, n'hésitaient pas à leur donner le premier rang, il y a plusieurs années, alors qu'elles étaient loin d'être aussi riches qu'aujourd'hui, et il nous a paru bon de former une annexe à notre Muséum, complément de ses collections préhistoriques, en publiant le rapport en question.

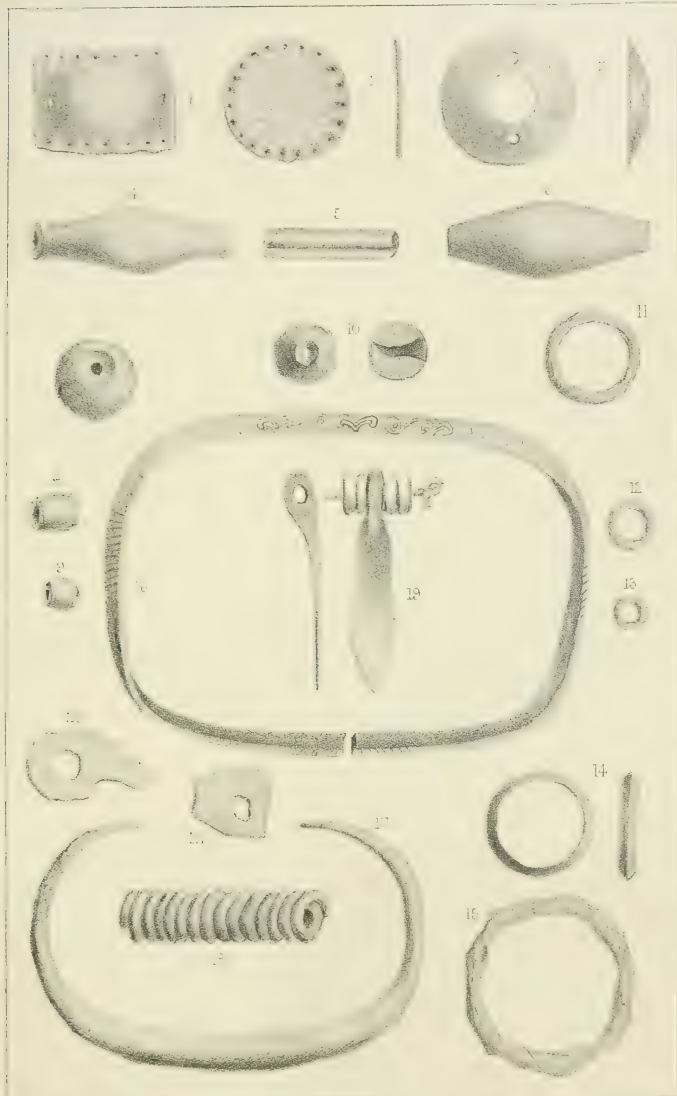
EUGÈNE TRUTAT

*Conservateur du Muséum de
Toulouse ; Secrétaire général
de la Société d'Histoire natu-
relle ; Membre de la Société
géol. de France, etc.*

ÉMILE CARTAILHAC,

*Attaché au Muséum de Tou-
louse ; Secrétaire de la Société
impériale archéologique du
Midi de la France ; Membre
de la Société géol. de France,
etc.*



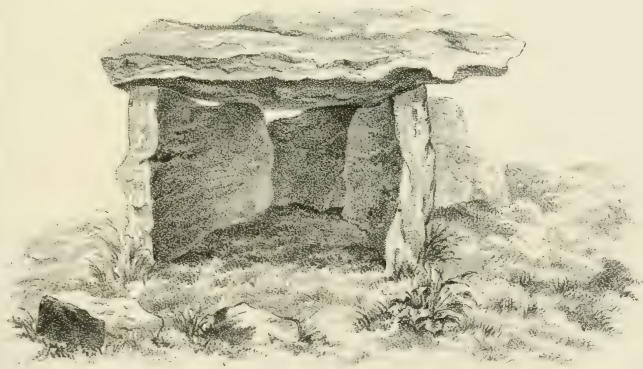




DOLMEN DE LAUMIÈRES. AVEYRON.

Table 3^m 80 haut des supports 1-29

Sur un grand Tumulus de 15^m de Diam.

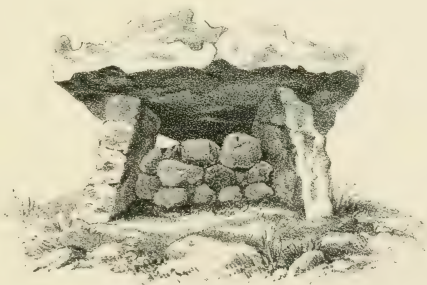


DOLMEN DE TIERGUES.

Table 2^m 89 haut 1-50



DOLMEN DE VAOUR. TARN ET GARONNE.



DOLMEN DE PEYRIGNAROL. AVEYRON.

Table 3^m 15 de long

dessiné E. O.



DOLMEN DE GRAILHE. (AVEYRON.)

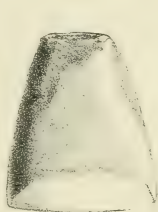
*8 metres de rayon**5 Supports*

DOLMEN DE LA COMBE DEL FAOU. (AVEYRON.)

*4 50 centimetres de rayon**5 Supports*



DOLMEN DE BOUSQUET. AV.

*6^m de rayon**Vue prise de l'Est*

1

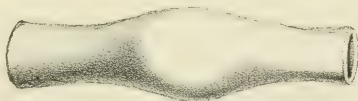


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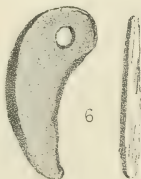


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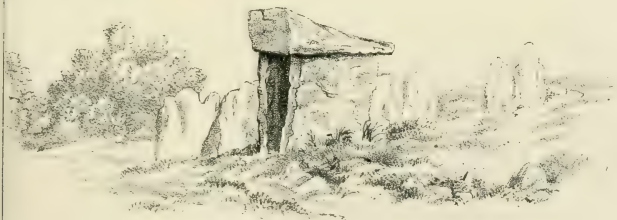
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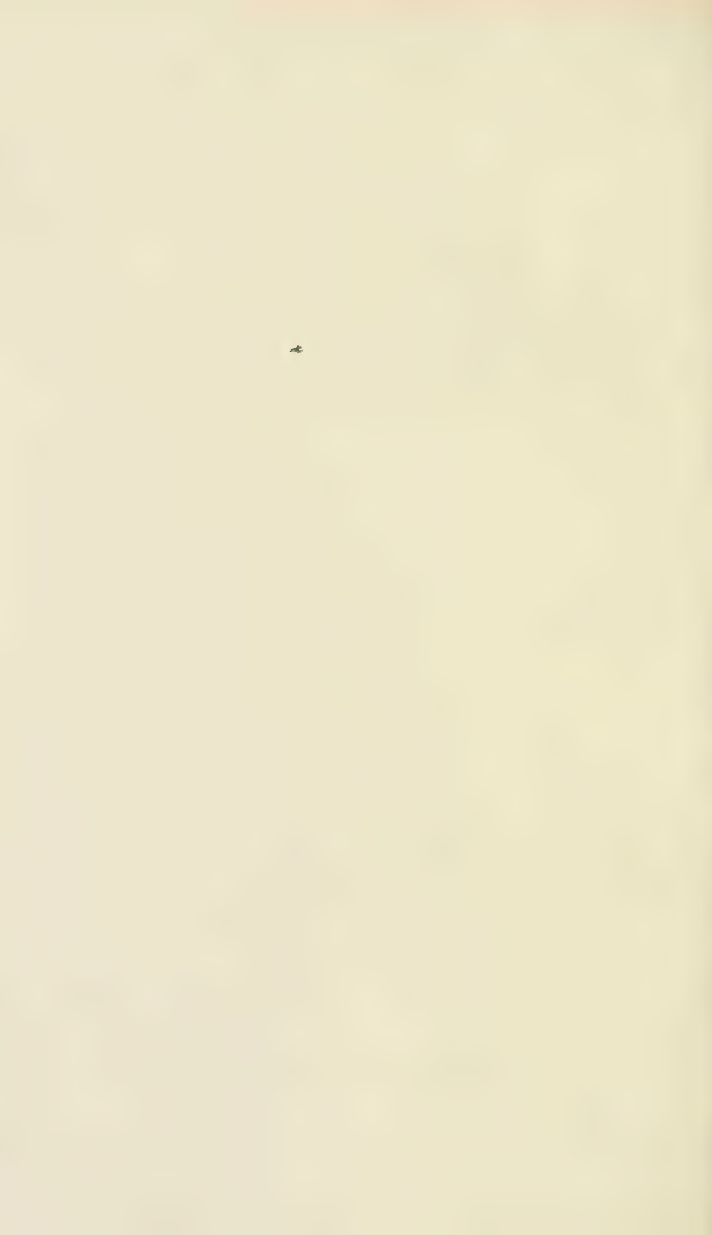


DOLMEN DE SAUCLIÈRES. AV.

*Table long 3^m**Orient O. E.*

DOLMEN DE SAUCLIÈRES. (AVEYRON.)

Orient S.O. NE



THE 'MERAVIGLIE.'

BY M. MOGGRIDGE, Esq., F.G.S.

(Member of the Italian Alpine Club.)

HAVING for six winters been prevented by the snow from visiting the Laghi delle Meraviglie, of whose marvels I had heard much from the natives, I determined on a Midsummer expedition for that purpose in 1868.

About thirty-two miles to the north of Mentone, a town now in the south-east corner of France, is a beautiful *pension*, at the upper extremity of gorges which rank among the finest in Europe, those of Saorgio and Paganin; the latter deriving its name from 'paga niente,' *i.e.* pay nothing, because in the olden time it was included in the territory of Tende, where the tax-gatherer was unknown. This *pension* is S. Dalmazzo di Tende, and is placed at the junction of two lateral rivers with the Roya. The western of these streams descends from the Laghi delle Meraviglie, which are six hours from the *pension*.

Accompanied by M. Dieck, an able and intelligent Prussian naturalist and a near relative of Count Bismarck, with a porter and a guide, I left the *pension* for the highest 'vacherie' in that western valley, four hours distant. One glance at the miserable hovel, occupied, during the short summer, by those in charge of the cattle, sufficed to show that the open air would be far preferable, and instructing the guide how to erect some sort of shelter against the storms, thunder, lightning, hail and rain, which came on every afternoon, we went on to explore. The result may be best blended with that of subsequent days. On our return, we found a tolerable *gîte* prepared for our reception. It is true that the rain penetrated the roof, but my mackintosh served to fend it off; and those who are particular might

have objected to the wind, which came in from all quarters, but our safety consisted expressly in that the wind *did come in from all quarters*, one current so neutralising another that there was no draught. On the whole we were well off though *standing* was out of the question, *sitting* practicable only under the ridge-pole. We were here at a height of 6000 feet above the sea, and two hours from our work.

From our *gîte* we passed the next morning through a tortuous valley, exhibiting marked traces of glacier action, until we arrived at an open space, full of small lakes evidently dug out by the ice, and surrounded by mountains of about 10,000 feet. Here we found proofs of the presence of the French in 1793. Passing on to the upper end of this open space, and leaving the river on our right, the rocks were still polished by the extinct glacier up to a height of 8000ft. above the sea; and on these rocks so prepared are many hundreds, perhaps thousands, of strange designs, the 'Meraviglie,' samples of which I have now the honour to lay before you, believing this to be the first time that they have been copied.

Though provided with ample means for taking rubbings, casts, &c., the weather was so bad that little could be done in that way. I went to work with the pencil, but soon found that M. Dieck was much quicker than myself, and at least as accurate. Therefore, confining myself to the task of finding fresh subjects, I have to acknowledge my obligation to the Prussian for the drawings.

I could discover no *writing*, in the common acceptation of the word. If any meaning is to be attached to these designs they must be read as hieroglyphics. The fact that the figures are frequently repeated and in *different combinations*, just as our letters are to form words, may accord with the supposition that they *have* a meaning.

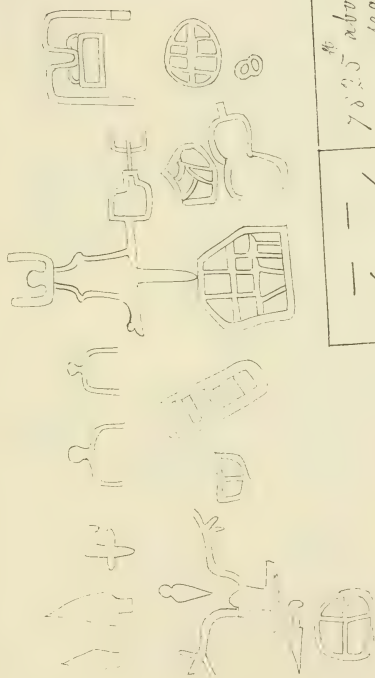
The inscriptions are generally on the horizontal surfaces of the polished rocks (which are mica-slate), sometimes on the sides, never where rope or ladder is needed in order to reach them. They are not carved or cut, but were effected by repeated blows of some bluntly pointed instrument.

The tradition of the country is that they were the work

of Hannibal's soldiers, but I am bound to say that Hannibal, in that country, plays the same rôle as Caesar, Oliver Cromwell, and his Satanic Majesty in England, to one or other of whom is popularly assigned the authorship of those things which cannot otherwise be accounted for. We have, however, among these designs, the Egyptian symbol for water, and the twisted horn of the antelope, both savouring of Africa. North of Scaræna, at about half-way between the Meraviglie and Nice, is a place where an altogether independent tradition says that the rocks were worked away to widen the path for the passage of the Carthaginian troops. Hannibal, it is believed, passed through a widely different country. After his great victory over the Gallic Celts at the passage of the Rhone, he marched to the north and north-east for a considerable distance. Then, turning southward, he crossed the Alps, probably at the Bernardine; and going south or south-west, found himself in the plains of Italy, where he must have seen between him and the sea the Maritime Alps, much lower than those mountains which he had traversed, and inhabited by the friendly Ligurian Celts, affording a line of march whereby two-thirds of the distance might be saved. He might therefore have sent back, to desire his brother Asdrubal, who commanded one body of his supports, to take the short cut over the lower mountains, the Roman army at Marseilles, which caused him to make that great détour, being withdrawn for the defence of Italy. In this case the two before-cited traditions might well be true. Another suggestion has been made by a gentleman who passed many years in India, viz. that the Meraviglie may have originated in a singular custom, similar to one which has for ages existed and still exists among the higher mountains, where, when the snow has melted, the natives flock to that lofty region to engrave upon the rocks certain mystic signs; this they regard as a notification to posterity. Some support may be derived for this idea, from the fact that one of the figures (in the upper part of the first plate) is the counterpart of an engraving in an old book in the great library at Turin, where it is called 'Idol Sarde.' The inscriptions, too, are obviously not all of the same date. For

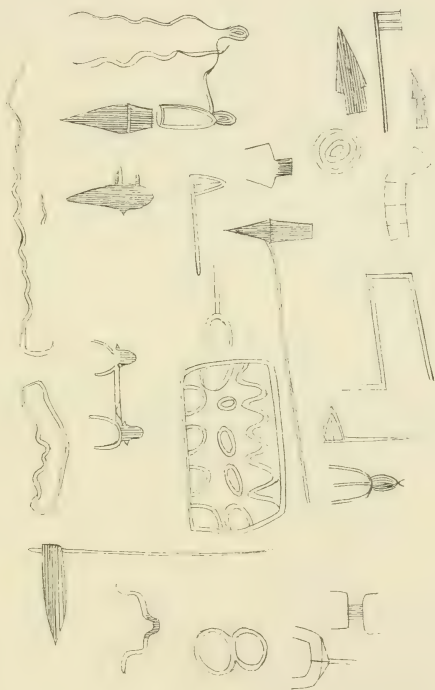
myself I have no wish to express an opinion one way or the other, but merely to state facts fairly, in the hope that those more competent may arrive at a satisfactory solution as to the question of origin, and possibly obtain a clue to enable them to decipher those strange designs, the MERAVIGLIE.

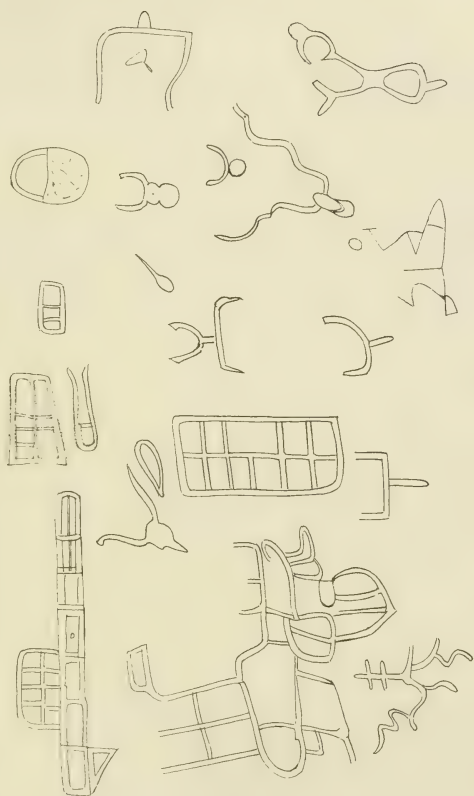




7825⁴⁶ above sea.







MEMOIR OF THE EXCAVATION OF THREE TUMULI ON
BROAD DOWN, FARWAY, NEAR HONITON, DEVON.

BY THE REV. RICHARD KIRWAN, M.A.

(*Rector of Gittisham, Devon.*)

IT is desirable on many accounts to place on record the leading facts connected with the discovery of the prehistoric relics that were brought to light at Broad Down upon the occasion of the excavation of three tumuli there under the auspices of the Devon Association for the Promotion of Science, Literature, and Art; for whilst the disinterment of such remains connected with primitive deposits has been of common occurrence in the adjoining counties of Cornwall on the one hand and of Wiltshire and Dorsetshire on the other, they have hitherto been of rare occurrence in Devonshire. I have a further inducement to follow this course by the occasion it affords of giving illustrations of the objects then discovered, for the benefit of those who may not have an opportunity of inspecting the originals. In addition also to their rarity a further interest gathers around these *sepulchralia*, from the fact that they supply a link in the chain of the prehistoric archaeology of the county. The two extremes of the series, which have been worked out with much ability, may be stated thus. The discoveries made at Brixham Cavern and Kent's Hole, near Torquay, carry back the existence of man upon the soil of Devonshire to a time coterminous with the cave-men of France and Belgium. Very different conditions of climate, of coast-line, of relative land and sea-level, then prevailed; probably the rigour of the glacial epoch still existed, whilst the mammoth, the cave-bear, the tichorine rhinoceros, and other extinct animals roamed over the district which now forms the shores of Torbay. We start then with this fact, that when man existed upon the

continent of Europe in the Glacial period (that is to say, at the most remote period of his history yet disclosed), he also existed in Devonshire. Here we have the one extreme of a series of which the other is limited by the first dawn of the Historic period. Of this we have numerous examples in Devonshire; nor need I refer to any other than that of the Roman Isca (Exeter), which has yielded abundant evidence of man possessing a knowledge of the metals and a certain amount of civilisation. The intermediate period, however, so far as regards this county, has been but imperfectly worked out, and yet surely it is not from want of materials. The cromlechs, sacred circles, dolmens, maenhirs, upright stones disposed in avenues, and other antiquities of a similar character on Dartmoor, the hill-fortresses of East Devon, and the ancient burial-mounds which are to be found dotting the summits of the higher ground in this and other parts of the county are so many landmarks of the history, the national customs, the social habits, and, it may be added, the warlike character of the early inhabitants of Devonshire. So abundantly are these time-honoured remains scattered over the hill-tops that frown down upon the vale of Honiton, that probably no district in England is richer in them. Almost every swelling prominence has its intrenched fortress, and of these some are so extensive that they would have required a small army to defend them against attack on all sides. I may cite as examples Hembury Fort, three miles distant from Honiton; it is of an ovate form, and measures about 400 yards in length and 130 in breadth. Within a mile of Broad Down is Blackbury Castle, measuring from east to west 220 yards, and from north to south 115 yards. The same district also abounds with the sepulchral remains of its early inhabitants. And yet, up to the present time, these memorials of a people the very name of whom is lost have attracted but little attention. Many barrows have been destroyed by the advancing plough of the agriculturist, but in no cases have the cinerary urns and other mortuary remains been preserved. Scarcely even has their discovery been recorded, or any relics of the period been figured. And yet, time was when these grave-mounds were regarded with far different feelings. So long as they were held to be the receptacles of treasure, a

royal licence had to be obtained before their exploration was permitted, but no sooner was that illusion dispelled than they came to be regarded with indifference. The following curious document occurs in the Patent Rolls of 17 Edward II., which secures to one Robert Beaupel the privilege of excavating six barrows in Devonshire, on condition that the search is made in the open day, and in the presence of the sheriff and other responsible officers. This instrument is as follows : *—

De terra fodenda pro thesauro abscondito querendo.—Rex Vicecomiti Devon. et omnibus aliis ballivis, ministris, et fidelibus suis in eodem Comitatu, tam infra libertates quam extra, ad quos, &c., salutem.

Quia datum est nobis intelligi quod in sex Collibus, et aliis locis diversis in Comitatu prædicto, thesaurus in terra absconditus existit, Nos, super hoc plenius certiorari volentes, assignavimus dilectum et fidelem nostrum Robertum Beaupel juniorem ad quærendum in sex Collibus et locis prædictis hujusmodi thesaurum sic absconditum. Ita quod pro eodem negotio possit terram fodere, et etiam lapides et ligna evertere suis sumptibus, pleno die, et in præsentia tua, præfate Vicecomes, et decenarii ac aliorum proborum hominum de partibus prædictis, qui inde veritatem valeant testificare. Et ideo vobis mandamus quod eidem Roberto in præmissis et ea tangentibus, intendentes sitis consulentes et auxiliantes quotiens et quando per ipsum Robertum ex parte nostra super hoc fueritis præmuniti. Proviso quod si thesaurus ibidem inventus fuerit sub sigillo prædicti Roberti et sigillo tuo, præfate Vicecomes, ac sigillis aliorum fide dignorum custodiatur, quousque Nos inde certiorati aliud super hoc duxerimus ordinandum. In ejus, &c.

Teste rege apud Westmonasterium, primo die Junii.

Leaving the town of Honiton by the Sidmouth road the ground quickly rises, and attains to an elevation of about 800 feet above the sea level. At a distance of three miles from the town, at a point where four roads meet, known as Hunter's Lodge, is a large flat stone which tradition says was once used as an altar for human sacrifices. It appears to be unhewn, presenting no marks of a tool on it, and may possibly have formed the capstone of a dolmen. Local tradition further states that the stone descends the hill every

* Quoted in Warne's *Celtic Tumuli of Dorsetshire*, p. 28.

night, bathes in the stream for the purpose of washing out the stain of human blood which is still upon it, and that before morning it returns to its original position.

They say blood will have blood;
Stones have been known to move, and trees to speak;
Augurs, and understood relations, have
By magot-pies, and choughs, and rooks, brought forth
The secret'st man of blood.—*Macbeth*.

If we now take the Seaton road (which is a branch of the old British and Roman Ikeneld way, that, passing from Colyford, over Farway Hill through the town of Ottery St. Mary, joins the main road at Fairmile) we observe at once, on the left, a circular mound, about 100 feet in diameter and eight feet high, crowned with trees. Other mounds of a similar character, though somewhat smaller in size, occur at irregular intervals; these are the first evidences of the cemetery of an extensive tribe—the outliers of the necropolis that we are now about to enter. As the eye travels along the undulating surface of the ridge that constitutes the boundary line of the coombes on either side, it detects here and there the swelling outlines of the tumuli which are the sepulchral remains of the early inhabitants of the district. Invariably they crown the summits of the ridge, and command a glorious panorama, presenting the finest combinations of scenery. Looking inwards you note the alternations of hill and valley, of wood and water, of heathy upland gradually merging into sunny pasture, and stretching out as far as the eye can reach; whilst if you view the prospect sea-wards it will be found to embrace the whole range of the great bay of Dorset and Devon, extending from Portland on the east to Berry Head on the west, and bounded on either side by coast scenery of the finest character. An inspection of the site of these tumuli serves to show that the position selected for them is not accidental. I have mentioned the fact that they crown the swelling summit of the hill, whilst again they are absent in the gentle hollows that occur between the undulations; and we can scarcely avoid the inference either that the brave warrior was buried on that spot which was within sight of the scene of his deeds of prowess, in order that his

companions in arms, as they looked upon his memorial, might be incited to emulate his valour; or else, that the mighty hunter was laid to sleep in that resting-place, from which his friends fondly hoped that his spirit would still look down upon the wooded slopes of the vale beneath, where perhaps the wild red-deer had often yielded to his skill in the chase.

In his description of the ancient barrows of Denmark Worsaae says :*—‘The barrows of this (the Bronze) period were placed, wherever it was possible, on heights which commanded an extensive prospect over the surrounding country, and from which in particular the sea could be distinguished. The principal object of this appears to have been to bestow on the mighty dead a tomb so remarkable that it might constantly recall his memory to those living near; while, probably, the fondness for reposing after death in high and open places may have been founded more deeply in the character of the people.’ A similar peculiarity appears to have distinguished the primeval burial-houses of Scandinavia.†

As we proceed on our journey eastward we reach the summit of Farway Hill, where, at a short distance to the left of the road, there is a circular entrenchment known as Farway Castle. It is about 200 feet in diameter, and is surrounded by an *agger* of low elevation, with a shallow fosse on the outside. We have here, probably, the remains of the inclosure within which resided the tribe whose *sepulchralia* we are about to examine, and who held this fortified position as a defensive place of refuge in case of a sudden raid by an enemy. Encircling this castle is a group of ten or twelve barrows formed of circular bowl-shaped mounds, rising gradually from the level of the ground towards the centre; they vary from forty feet to eighty feet in diameter, and attain a perpendicular height, which ranges from four or five to twelve or fourteen feet. Some members of this group of barrows were partially destroyed when the high road across the hill was made, at the commencement of the present

* Worsaae's ‘Primeval Antiquities of Denmark,’ p. 97.

† Nilsson's ‘Primitive Inhabitants of Scandinavia;’ translated by Sir John Lubbock, Bart., p. 13.

century (for up to that time a trackway only had existed), and at the same time tradition says, that sepulchral urns were discovered, none of which, however, were preserved. A glance at the surrounding district suffices to show that the advances of agriculture, as it has made its way up the hill slopes, has promoted a wholesale destruction of these grave-mounds. Here and there a field may be observed which has been reclaimed from the moorland waste, the level surface of which bears no evidence of sepulchral monuments; whilst, immediately contiguous to the hedges that bound the field, tumuli are numerous. The conclusion seems irresistible that others were destroyed, and all traces of them obliterated, when the field was inclosed. Wherever the once verdant surface of the down has disappeared beneath the ravages of the plough, there have barrows been levelled, and the vestiges of the ancient inhabitants ruthlessly destroyed.

Continuing our journey in the same direction, we arrive at that part of the hill known as 'Broad Down,' where, by the kind permission of Sir Edmund S. Prideaux, Bart., it was resolved that excavations should be made in the presence of the members of the Association.

I will now proceed to describe three barrows, in the order in which they were examined.

The first (A), was situate in a field to the east of the high road, overlooking the beautiful vale known as Roncombe Gurt: it measured eight feet in perpendicular height, and ninety-four feet in diameter; around it there appeared to be traces of a shallow ditch or fosse. The action of the plough had gradually worn down the surface of this barrow, so that its height had been reduced by some two or three feet, and the fosse had become well-nigh obliterated, although the mound still retained its circular form and symmetrical curvature. Since the excavations were made, I have observed that the remains of a circle of large boulders may still be traced around a neighbouring barrow: these stones are firmly bedded in the tough peaty soil, and are partially overgrown with heather and furze. They resemble in character the stones that are still to be met with in the neighbourhood, though probably collected from different places, there

being among them grey weathered and smooth stones from the surface of the moor, which had once been exposed to the eroding influence of the atmosphere, as well as angular masses of flint or chert which had been quarried in the neighbouring hill sides. It appeared probable that at least all the large members of this group of grave-mounds were once protected by a circle of boulders placed at regular intervals around the base of them, a peculiarity that assimilates them to some tumuli in Northumberland that have been lately explored.* In most cases these stones have long since been carried away to be used for building purposes, or to be broken up for the repair of the roads.

Operations were commenced by cutting a trench four feet wide through the centre from south-east to north-west. The mound proved to be formed of alternate layers of peat and blue clay, which the workmen said did not belong to the locality. It appeared never to have been previously disturbed. No indication of a deposit became apparent until the natural surface of the ground was reached at the centre of the barrow, where a layer of charcoal, apparently the burnt remains of small sticks or brushwood, such as the surrounding furze and heather would supply, yielded the first intimation of an approaching '*find*.' Interspersed with the charcoal were nodules of ruddle;† beneath it was a thin ferruginous seam, perfectly solid and hard, like stone, which possibly might be the result of heat. In this and the two tumuli to be hereafter described iron ore occurred abundantly, either in the form of a thin band or in the shape of nodules of iron pyrites. The latter mineral is of common occurrence on the surface of the hill, but it is present in these barrows in such abundance as to suggest the probability of its having been placed there

* See an article entitled 'Descriptions of Cairns, Cromlechs, Kistvaens, and other Celtic monuments,' by Captain Meadows Taylor.—Transactions of the Royal Irish Academy, vol. xxiv.

† Red-ochre or red hæmatite. A stratum of this ore occurs at Peak Hill, near Sidmouth, about six miles distant from Broad Down. Mr. Bateman suggests in 'Ten Years' Diggings,' p. 179, that ruddle was probably used as a war-paint by the ancient Britons. He mentions the occurrence of a nodule in a barrow at Castern, 'which, from its abraded appearance, must have been in much request for colouring the skin of its owner.'

designedly.* Possibly it was then, as now, regarded as a 'thunderbolt,' and belonged to the class of objects that was supposed to have a talismanic virtue. Beneath the bed of charcoal just mentioned was a layer of flint stones, placed with some regard to order side by side, so as to form a kind of pavement 13 feet by 9 feet.† The interstices between the stones were filled up with blue clay, which in some instances had become baked by the action of the fire when the funeral pyre was kindled; from the same cause the surface of the stones, where not protected by the clay, had been partially vitrified. Beneath this layer of stones was the natural surface of the ground, which appeared to have been pared down to the depth of a few inches, as if to afford an even surface. The general features in connection with this barrow will be best understood by reference to the diagram. (See Plate I. fig. 1.) Increased care was now used as we proceeded with the investigation, and the excavations were steadily carried on until we reached the original surface of the ground, exactly below the centre of the mound, where we discovered the interment: it consisted of a simple deposit of calcined bones resting upon the charcoal, which spread out from the bones for some distance, and covered the layer of flint stones which formed the hypocaust. Immediately contiguous to this deposit, raised slightly above it, and a few inches to the east, a drinking-cup was uncovered. Fortunately it was moved in a state of complete preservation, with the exception only of a slight indentation on the rim, which the workman made with his pick-axe. On the removal of this cup it was taken to a neighbouring cottage, and as it began to crack and warp by exposure to the atmosphere it was immersed in water. This very rare and curious relic measures $3\frac{5}{8}$ inches in height, and attains at its greatest diameter, which is at the mouth,

* In a list of the 'Vestiges of the Antiquities of Derbyshire,' tabulated by Sir J. Lubbeck, several instances are mentioned in which iron pyrites was found in barrows.

† A barrow opened at Tenby, and described as paved with stones, is mentioned in *Arch. Journ.* vol. x. p. 76. See also Warne's 'Celtic Tumuli of Dorset,' p. 41, who, in describing the excavation of a barrow, says, 'A portion of the base of this mound was rudely paved.'

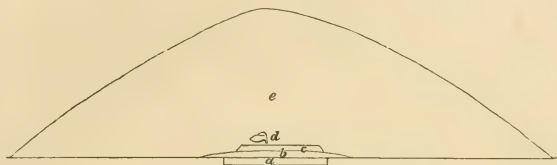


FIG. 1.—SECTION THROUGH THE CENTRE OF [A] BARROW.

- | | |
|--|-----------------------------|
| a. Pavement of flint stones. | c. Layer of calcined bones. |
| b. Deposit of charcoal. | d. Cup. |
| e. Mound of clay and earth irregularly stratified. | |

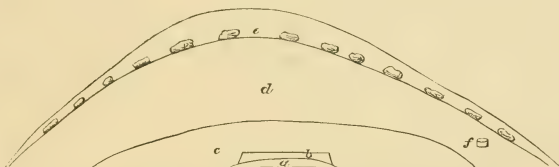


FIG. 2.—SECTION THROUGH THE CENTRE OF [B] BARROW.

- | | |
|-----------------------------|---------------------------------------|
| a. Deposit of charcoal. | d. Burnt earth and charcoal. |
| b. Layer of calcined bones. | e. Layer of stones capping the mound. |
| c. Bed of clay and earth. | f. Probable position of incense cup. |

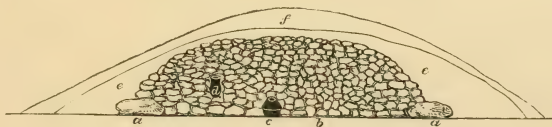


FIG. 3.—SECTION THROUGH THE CENTRE OF [C] BARROW.

- | | |
|------------------------------|-------------------------------|
| a. Circle of large boulders. | d. Drinking Cup. |
| b. Cairn of flints. | e. Burnt earth and charcoal. |
| c. Urn. | f. Covering of surface earth. |



Fig. 1.—DRINKING-CUP, FOUND IN A BARROW AT BROAD DOWN, FARWAY,
NEAR HONITON.

(Orig. size. Albert Memorial Museum, Exeter.)

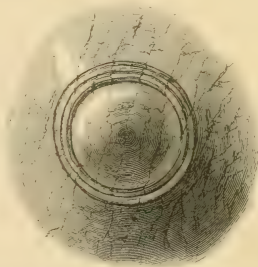


Fig. 2.—BOTTOM OF THE CUP, SHOWING THE TERMINAL ORNAMENT.

a width of three inches ; its capacity is about a gill. (See Plate II. fig 1.) The form of the bowl is oval, or bell-shaped, tapering downwards from the rim and terminating in a cone ; originally the periphery was circular, but it has become in a slight degree distorted by the post-mortuary pressure of the earth beneath which it lay. The ornamentation of this cup consists externally of four series of hoop-like rings that encircle the bowl in a plane parallel to the rim ; of these the first, consisting of three rings, occurs immediately beneath the lip ; a second course, consisting of five rings, is found around the centre of the bowl, which thereby is divided into an upper and lower section ; a third course, consisting of four incised lines, is situated at about the centre of the lower section of the bowl, whilst at the apex of the cone is a terminal ornament of three concentric circles. (See Plate II. fig 2.) The border of the cup is ornamented along its interior margin by a simple pattern of two parallel chevrons zig-zags that run beneath a single horizontal incised line. The handle, which is of one piece with the bowl, is too small to admit of the insertion of a finger, and was probably intended to be used for passing a string, as a means of suspending the cup from the shoulder or waist of its owner. It measures $1\frac{3}{4}$ inch in length, attains a mean breadth of $\frac{3}{4}$ inch, and is about $\frac{1}{4}$ inch in thickness ; its ornamentation consists of two upright bands, each of which is formed of three parallel lines that are continued along either edge upon its exterior surface.

A curious and interesting question arises as to whether this cup is hand-made or lathe-made. The difficulty of forming such a vessel on the lathe, so as to leave the projecting handle (which it will be remembered is of one piece with the bowl), would at first sight appear to be almost insurmountable, and would suggest that it is hand-made. And yet, upon a close examination of the bowl of the cup, the incised lines that form its ornamentation occur with such regularity as almost to preclude the possibility of their having been carved by hand : moreover also, marks, similar to those which a rotating tool would produce, may, I think, be traced within the interior of the vessel. This latter opinion is confirmed by that of a skilful practical turner to

whom I took an opportunity of submitting the cup. He expressed himself satisfied that it had been made on the lathe, and added that there would be no difficulty in turning the upper part so as to leave a projection that would admit of being afterwards fashioned by the chisel and cut through into a handle.*

The excavations had reached this point when the members of the Association arrived on the morning of July 31. Naturally, the cup was an object of great interest, and speculation was rife as to the material of which it was composed. At first it was thought to be made of pottery; when it had become dry by exposure to the atmosphere it presented the appearance of wood or of bog-oak. On testing with nitric acid, a very small fragment that had become detached from the cup was observed to blacken in the presence of the acid; this was a proof that carbon entered largely into the combination of the material, and that it had an organic origin. A few days after its disinterment, I availed myself of an opportunity that offered of sending the cup to London with a view to obtaining from the authorities at the British Museum an opinion as to its material. It was submitted to the inspection of Dr. Birch and Mr. Franks, by both of whom it was considered to be formed of Kimmeridge shale. Afterwards it was submitted to Professor Tennant, and also to Mr. Etheridge, one of the curators of the Museum of Economic Geology in Jermyn Street, by both of whom an opinion was expressed to the effect that it was formed from a lump of Bovey Tracey lignite. Under these circumstances, I referred the question to W. Pengelly, Esq., F.R.S., of Torquay, who has devoted much attention to the beds of Bovey lignite, and who contributed a monograph thereon to the Transactions of the Royal Society. Mr. Pengelly writes as follows: 'I was present when the Broad Down tumuli were opened in July last, and saw the vase in question very soon after it was found. I confess that I am very sceptical

* In Wilde's '*Catalogue of the Museum of the Royal Irish Academy*,' pp. 217 *et seq.*, there occurs a description of several ancient wooden methers or circular drinking-cups; they are mentioned as 'of a single piece, most of which were turned on a pole-lathe, and of various sizes, from those capable of holding about a quart of fluid measure to others not larger than a wine glass.'

about its being formed of Bovey lignite; and this, partly because of my recollection of the vase, and partly on account of the provoking tendency of the lignite to crack and break into pieces on exposure to the air. This, however, I hope to test very soon, by getting a vessel turned of lignite, if possible.'

The opinion thus expressed by Mr. Pengelly is confirmed by that of John Divett, Esq., proprietor of the Bovey lignite beds. He writes as follows: 'With regard to the little vase that you mention, I do not for a moment believe that it was turned from Bovey coal. That the Bovey coal is *torno rasile* I doubt not, but I know not the conditions under which a vessel turned out of Bovey coal could hold together for many years. I have seen a piece, well varnished, remain in shape for some time, but even this protection does not last long.'

It may not seem irrelevant to the subject under consideration to notice the singular little cup described as of oak, found in 1767 in the King Barrow, Stowborough, near Wareham, Dorset. The interment was in this instance in a large hollow trunk of an oak; several human bones, unburnt, lay in this depository, wrapped in deer-skin. No weapon or traces of metal were found, with the exception of a small portion, as stated, of gold lace. The cup measured about two inches in depth; the mouth was elliptical in form, the major axis measuring three inches, and the minor two inches; it was ovate or bowl-shaped, and had probably been placed at the head of the corpse; the exterior surface was engraved with horizontal and oblique lines. Although described by Mr. Hutchins as formed of oak, it is more probable, as suggested by Dr. Wake Smart, that it may have been of the Kimmeridge shale of the district.* Worsaae† describes an interment, very similar in character, that occurred in a barrow in Denmark: It was laid in the stem of an oak that was very thick, about ten feet in length,

* This cup is figured in Hutchins' 'Hist. Dorset,' vol. i. p. 27, 1st edition, 1774; Camden's 'Britannia,' vol. i. plate ii. p. 76, edit. Gough. See also the account by Mr. Hutchins, 'Gent. Mag.' vol. xxxvii. p. 53; and Warne's 'Celtic Tumuli of Dorset:' 'Tumuli opened at various Periods,' p. 4. This remarkable relic came into the possession of Gough: it is not known whether it still exists.

† Worsaae's 'Primeval Antiquities of Denmark,' p. 96.

and split in two; several remains of garments were found, a lock of brown human hair, a bronze dagger, palstave, &c., and 'a small round wooden vessel, with two handles at the sides, in which was found something which had the appearance of ashes.'

In a paper entitled 'The Kimmeridge Coal-money,' contributed to the Purbeck Society in 1857 by the Rev. John H. Austen, there occurs a description of vessels composed of Kimmeridge coal or shale that had been discovered. A communication is there noticed, made by (the late) Professor Henslow to the Cambridge Antiquarian Society in the year 1846, on the materials of two sepulchral vessels which were found at Warden in Bedfordshire.* He says: 'Upon looking over some fragments of Romano-British pottery from the neighbourhood of Colchester, I met with what appears to have been part of a large *patera*, or at least some vessel with a flat surface and a shallow projecting rim. This fragment is of the same material as the Kimmeridge "coal-money;" and bears the impression of a fossil ammonite (?) distinctly marked upon its surface. Upon drying, it has become cracked and *warped*, precisely in the same manner as we see the specimens of the "coal-money."'[†] He goes on to describe the two vessels which were found at Warden in Bedfordshire (one of them now in the possession of the Cambridge Antiquarian Society, and the other in the British Museum), which, he says, are 'composed of a bituminous shale, in all respects similar to that which occurs in the Kimmeridge clay, and from which the coal-money has been turned.'

An account of the discovery of two other vessels formed of Kimmeridge coal is thus given by Albert Way, Esq., F.S.A.: 'In December, 1856, two remarkable vessels, formed of Kimmeridge coal or shale, were discovered in immediate proximity to Roman remains at Great Chesterford, Essex, and are now preserved in the Museum at Audley End. The vessels were so perfect, and the condition of the material so compact,

* See Transactions of Cambridge Antiquarian Society, where are two plates representing the vases.

† Papers read before the Purbeck Society, p. 93, by the Rev. John H. Austen.

that they were for some time concluded to be of wood. By exposure to the air the coal has cracked and exfoliated, precisely as the "coal-money" usually does. No doubt can exist of the identity of the material. The vessels have been carefully compared, by many persons who have seen them, with the "coal-money," for which we are indebted to Mr. Austen. The material is precisely the same. The vessels of shale are remarkable as having been turned out of blocks of such large dimensions, whereas the vases found at Warden in Bedfordshire were formed of several pieces rabbeted together.*

Mr. Way also informs me that in the Museum at Boulogne is a covered box of about four and a half inches in diameter, which he believes to be made of Kimmeridge coal, from the exact identity of material with those found at Great Chesterford. By the friendly assistance of the same excellent authority, who speaks *ex cathedrâ* on this and kindred subjects, I am enabled to supplement this list of vessels formed of Kimmeridge shale by other examples, which afford the means of suggestive comparison with the cup before us. In draining a withy-bed at Rempston, near Corfe Castle, in the year 1845, the workmen came upon a deposit of Kimmeridge coal-money (so called) that occurred beneath a bed of peat; with it was a vessel described as 'like the bowl of a large glass or rummer, and with the bottom or stand broken off.' Here we have an unrecorded instance of a cup, similar in form to that found at Broad Down, indubitably of Kimmeridge shale. Now as the 'coal-money' with which this cup was associated is an undeniable proof of turning craft,† it is reasonable to suppose that the cup here alluded to was an imperfect or damaged object thrown aside with the refuse of the lathe. The remark that 'the stand was broken off' may probably refer to the portion of the shale that pivoted on the lathe, and which would have been turned off, or cleared away smooth, had the vessel not been rejected as a failure before its completion. In explanation of the use of this

* Archæological Journal, vol. xiv.

† Kimmeridge coal-money is now known to be the central part that was turned out of rings, amulets, *armillæ*, and other circular ornaments that were lathe-made. It was thrown away as refuse.—Rev. J. H. Austen, *l.c.* p. 92.

material in the manufacture of cups, *pateræ*, and personal ornaments, for which it appears to present no peculiar advantages, Mr. Austen suggests that possibly a superstitious value attached to it. This opinion is based on the fact that amulets of Kimmeridge coal, *armillæ*, beads, and other such ornaments, have been frequently found on the floor of barrows.* A large slab of this material has occasionally occurred as the covering of an interment in a tumulus: and the same writer quotes the authority of Pliny, who mentions that the *gagates* of Britain, a mineral to which the lignites and shales of the Dorsetshire coast and of Devon bear a certain family resemblance, possess, amongst other medicinal or magic virtues, that of driving away serpents.†

In noticing other objects which appear to present features of analogy with the drinking-cup found at Broad Down, and that by comparison may assist us in arriving at a knowledge of the relative date to which it should be referred, I may allude to the remarkable discovery of a cup of gold, that was disinterred from a barrow on the manor of Rillaton in Cornwall in the year 1837. It is thus described by E. Smirke, Esq., vice-warden of the Stannaries: ‡ ‘The mound or barrow was about thirty yards in diameter. After removing part of the superincumbent earth and stones, they (some labourers in search of stone for building) came upon a vault or cist of rough masonry, forming an oblong four-sided cavity, consisting of three vertical stones on each of the longer sides, of one stone at each end, a large flat one below, and a large flat covering stone above. Within the vault, and about three and a half feet from the north end, were found two vessels lying near each other, one being of earthenware, the other and smaller being the gold cup before us. . . . This highly curious cup—so far as I am aware unique—measures in height three and a quarter inches; diameter at the mouth,

* Some of these ornaments are figured in Sir R. C. Hoare’s ‘Ancient Wilts,’ vol. i. plate xxxiv. See also Transactions of the Archaeological Association, 1845, in which occurs a description of two ornaments of Kimmeridge coal, found in a barrow on Alsop Moor, and which, the author suggests, ‘were attached to the dagger as charms.’

† Pliny, ‘Nat. Hist.’ lib. xxxvi. cap. 19.

‡ Journal of the Royal Institution of Cornwall, No. ix. 1868.



FIG. 1.—GOLD CUP, FOUND IN A BARROW IN RILLATON MANOR, CORNWALL.

($\frac{2}{3}$ Actual size. Now preserved at Osborne.)



FIG. 2.—BOTTOM OF THE CUP, SHOWING THE TERMINAL CORRUGATIONS.

Exhibited by permission of the Queen, and of the Prince of Wales, at a meeting of the Royal Archæological Institute. June 7, 1867.

Reproduced by permission of the Central Committee of the Royal Archæological Institute.

three and three-eighth inches ; at the widest part of the bowl, three and a half inches. The handle measures one and a half inch by seven-eighths of an inch, greatest width. The weight of the cup is two ounces, ten pennyweights ; its bullion value about ten pounds. The handle, which has been a little crushed, is attached by six rivets, three at the top and three at the bottom, secured by small lozenge-shaped nuts or collars. This appendage, it should be observed, seems, at least in its present state, fit only for means of suspension, barely affording sufficient space for the smallest finger to be passed through it. Indeed the cup does not stand firmly on its base, and I have doubts whether it was intended to do so. On the bottom of the cup there are concentric rings or corrugations, like those on the rest of it, around a little central knob about a quarter of an inch in diameter.

By the courteous permission of the Royal Archæological Institute I am enabled to append an illustration of the gold cup found at Rillaton (Plate III. fig. 1), and also a figure of the bottom of the cup showing the terminal corrugations (Plate III. fig. 2). Many points of resemblance between this cup and that of Broad Down will be readily observed ; as, for instance, the general outline, which in both cases is ovate or conical, the rounded base, and the character of the ornamentation : these, and other peculiarities which will be suggested by a comparison of the illustrations, indicate a certain general resemblance between the two examples before us.

In searching for other examples of cups or vessels which in character are not dissimilar, we must not fail to notice the amber cup that was found in a barrow at Hove, near Brighton, in the year 1856. It is thus described by Barclay Phillips,* Esq.:—‘On reaching the centre of the tumulus, about six feet east of the road to Hove Station, and about nine feet below the surface, in stiff clay, the labourers struck upon a rude wooden coffin, six or seven feet in length, deposited east and west, and formed with boards apparently rudely shaped with the axe. The wood soon crumbled to dust ; a knot, however, or gnarled knob, was preserved, and ascertained to be of oak. In the earth with which the coffin was filled

* *Archæological Journal*, vol. xiii. p. 183.

many fragments of bone were found, seemingly charred. About the centre the following objects were discovered:—
'1. A cup or bowl, supposed to be of amber, with one small handle near the rim, sufficiently large to pass a finger through it. A band of five lines runs round the rim, interrupted by the handle. The height of the cup is two and a half inches, diameter three and a half inches, average thickness one-fifth of an inch. The interior surface is smooth, and the appearance would indicate that the cup had been formed on a lathe, which, however, seems scarcely possible, when the position of the handle is considered. The cup would hold rather more than half a pint.

'2. A stone axe perforated for the haft; it is of an unusual type, and is wrought with much skill; the length of it is five inches.

'3. A small hone (?) of stone, measuring two inches and seven-tenths in length, perforated at one end.

'4. A bronze blade of a type which has frequently occurred in Wiltshire and in other parts of England.

'The labourers state that the coffin rested on the natural soil, stiff yellow clay, whilst the barrow seemed to have been formed of the surface mould of the locality and rubbish, heaped together with considerable quantities of charred wood.'*

If the reader will refer to Plate IV. fig. 1, which represents this amber cup, and also to fig. 2, which represents its handle, it will be seen at once that we have here again a certain constructive resemblance with the vessel from Broad Down. The rounded base, the ovate form, the smallness of the handle, and the character of ornamentation, all concur in pointing to a general approximation of type.

Among other relics that claim notice in connection with the subject before us two small urns, of a type that has been regarded as peculiarly Irish, deserve attention as presenting certain features of analogy with the peculiar cup found at Broad Down, and also with other vessels that have been mentioned. These Irish *ficilia* are formed with a pointed base,

* Contributed through the kindness of the Rev. T. Powell, Honorary Secretary of the Sussex Archaeological Society.



FIG. 1.—AMBER CUP, FOUND IN A BARROW AT HOVE, NEAR BRIGHTON.

($\frac{1}{2}$ Orig. size. Brighton Museum.)



FIG. 2.—FRONT VIEW OF THE HANDLE OF THE CUP.

Reproduced by permission of the Hon. Secretary of the Sussex Archaeological Society.

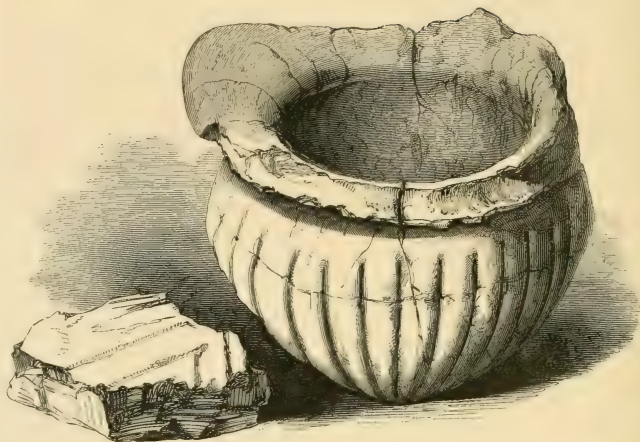


FIG. 1.—SMALL OVATE VESSEL, FOUND IN A CIST AT CASTLE COMER, KILKENNY,
AND A FRAGMENT OF A CYLINDRICAL URN, IN WHICH IT WAS ENCLOSED.

(Orig. size.)



FIG. 2.—INCENSE CUP, FOUND IN A BARROW AT BROAD DOWN, FARWAY, NEAR
HONITON.

(Orig. size. Albert Memorial Museum, Exeter.)

so that, like the antique *rhyton*, or the fox's head drinking-cup of modern times, they could not stand erect. A similar fashion appears in some drinking vessels of glass of the Anglo-Saxon period. Of one of the little vessels to which allusion has been made, a representation is given by kind permission of the Archæological Institute,* Plate V. fig. 1. It was found near Castlecomer, Kilkenny, in quarrying stones; it had been deposited in a small circular cist, formed of stones, resting upon a slab about two feet square, another slab covered the top. Within this cist there was an earthen cylinder, described as without a bottom, but this part may possibly have perished, or have been broken away. This urn was rudely scored with a chevrony pattern; and within it had been placed the small vessel mouth downwards. It is of hard-grey or ash-coloured ware, and even in its present broken state shows considerable elegance in form. The lip is unusually broad, and projects so as to render the little base apparently ill-suited for the purpose of a drinking-cup. There is no handle. The lower part, ribbed like a melon, tapers to a point at its base. Around it and within the cylinder there were many calcined fragments of bones, of which also a quantity were found outside the cist. The Rev. James Graves, secretary of the Kilkenny Archæological Society, by whom this discovery was made known to the Institute in London, observes that this specimen bears close resemblance, in size and shape, to that found near Bagnalstown, county Carlow, a figure of which was published by the Royal Irish Academy.† This object is now in their Museum. Mr. Graves remarked that the small funereal vases of this type seem intended to have been placed inverted, perhaps over the ashes of the heart, and within larger vessels containing the other relics of the body. The fragments of the large urn are of red, imperfectly baked ware; the bones enclosed within it comprised fragments of the rib of an adult, with the phalangeal bones of an adult; the whole had been exposed to cremation. This little urn may have measured in its perfect state about three inches in height.

* Reproduced from the Journ. Arch. Inst. vol. viii. p. 200.

† Proceedings, vol. iv. p. 36.

The vessel referred to by Mr. Graves as having been discovered at Bagnalstown is thus described by Sir R. Wilde. 'When reversed, the bowl (which is rounded at the base) presents, both in shape and ornamentation, all the characteristics of the Echinus, so strongly marked that one is led to believe the artist took the shell of that animal for his model. . . . It possesses the rare addition of a handle,* which has been tooled over like the rest of the vessel. This beautiful little urn stands but two inches and one-third in height, and is three inches and three-quarters across the outer margin of the lip, which is the widest portion. Its decoration consists of nine sets of upright marks, each containing three cross-barred elevations narrowing towards the base, which is slightly hollowed; the intervals between these are filled with more elaborately worked and minute impressions, each alternate space being further ornamented by a different pattern. A rope-like ornament, surmounted by an accurately cut chevron, surrounds the neck. The lip, which is nearly flat, is one of the most beautifully ornamented portions of the whole: a number of small curved spaces, such as might be made by the point of the nail of the forefinger, surround the outer edge, and also form a similar decoration on the inner margin; upon the flat space between these, somewhat more than half-an-inch broad, radiate a number of very delicately cut lines.†

Such then are the particulars that I have been enabled to collect concerning cups or vessels associated with ancient interments, and which afford materials for useful comparison with the specimen from Broad Down. At the conclusion of the memoir I will briefly summarise these facts, and point out the inferences as to the relative age of this barrow and its contents which these notices tend to establish. It is worthy of remark that the tumulus from which this cup was taken was entirely barren of any further results. Subsequently we extended laterally the trench that had been originally cut through the barrow, and also carried out a careful

* This is small, and agrees in typical character with that of many of the cups already described.

† Catalogue of the Museum of Antiquities of the Royal Irish Academy, p. 179.

examination for a considerable distance around the centre, but without finding another deposit. Not a vestige of pottery, no flint flake, worked flint, or weapon of any kind was discovered, which could afford a clue to the people by whom this tumulus was built, or to the relative age in which they lived.

We next proceeded to examine a barrow (B), which lay about one hundred yards to the south-west of that which we have just described. It was about ninety feet in diameter, had been originally surrounded by a shallow fosse, and was eight feet in perpendicular height at the apex of the mound; owing to the land being under cultivation the height of the tumulus was much reduced. As in the former barrow (A), we commenced by cutting a section three feet wide from the south towards the north through the centre, and afterwards extended it towards the east and west for two feet on each side of our first section, so as to make the trench seven feet wide. As the mound was explored we came upon signs of burning, at first slight, but gradually increasing in abundance, until at the centre burnt earth and charcoal, with a few calcined flints at intervals, formed almost the entire mass, and presented a beautiful section as we proceeded. After passing beyond the centre, when we approached the periphery towards the north, we again came upon the surface earth with which the barrow had originally been capped. We also observed a layer of large flat stones overlying the burnt materials of the mound. For further particulars concerning the structure of this barrow the reader is referred to the diagram, Pl. I. fig. 2.

Thus far the preliminary exploration had been made when the members of the Association visited the tumulus, and up to this time the excavations were barren of result; no trace of interment either by cremation or inhumation, no implement of any kind had been found in this barrow. However, whilst one of the visitors was walking around the tumulus inspecting the works in operation, he discovered amongst the débris thrown out by the workmen from the trench, a very perfect example of the so-called 'incense-cup.' It is two inches high, three inches wide at the mouth, and averages in thick-

ness about half an inch. In colour it is pale brown, formed of finer and better clay than are any of the fictilia to be hereafter described, and, though hand-made, shows a certain degree of skill in the ceramic art, and in some measure approaches Roman terracotta. (This cup is represented in Pl. V. fig. 2.) On the external surface it is decorated with straight lines arranged in a pattern. The ornamentation is divided into compartments by incised lines, between which there occasionally occur herring-bone markings, made by some narrow tool, perhaps a pointed flint or bone, which has been pressed into the soft clay. The perpendicular lines are terminated by a horizontal band, encircling the vessel above and below parallel to the rim. The irregularity of these points to the conclusion that they were not formed on the wheel. The rim is ornamented by a single row of incised angular markings arranged herring-bone fashion. Additional interest attaches to this beautiful specimen of early British mortuary vessels from the fact, that the under-surface of it is curiously wrought with incised lines, arranged in four quadrants of the circle, which again are formed by lines radiating from the centre towards the circumference, and constituting an imperfect cruciform ornament. Attention has lately been called by Mr. Way * to the fact, that these mysterious little sepulchral vessels, when found at all—which is rare—are occasionally ornamented on the under-surface with a decoration that is characterised by the cruciform type. Such is the case with the specimen from Broad Down now under consideration. By reference to Pl. VI. fig. 1, which gives an illustration of the under-side of this ‘incense-cup,’ it will be observed that of the lines radiating from the centre, with which it is scored, the four principal lines meeting in the centre form a cruciform ornament. It should be added that on one side of this vessel are two small perforations (Pl. VI. fig. 2); this peculiarity is common with vessels of this particular type.† In most cases they occur on one

* *Archæologiæ Cambrensis*, 3rd series, vol. xiv.

† For further particulars concerning these vessels the reader is referred to an article ‘On the Ancient Interments and Sepulchral Urns found in Anglesey and North Wales,’ by the Hon. W. O. Stanley, M.P., with additional observations by

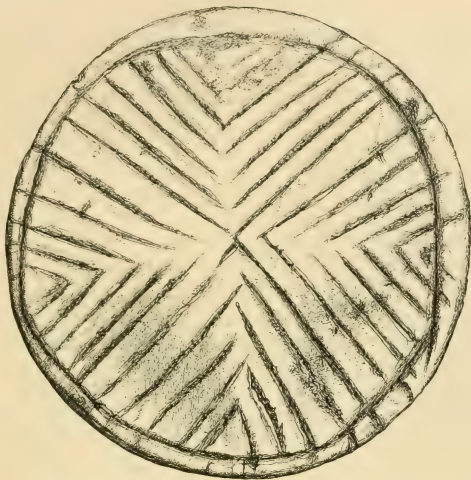


FIG. 1.—INCISED ORNAMENT ON THE BOTTOM OF AN INCENSE CUP, FOUND IN
A BARROW AT BROAD DOWN.

(Orig. size.)

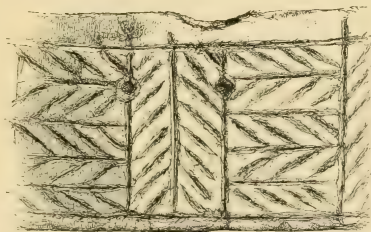


FIG. 2.—REPRESENTING THE TWO PERFORATIONS ON THE SIDE OF THE
INCENSE CUP.

side only, but in many examples they are found on both sides.

The question has often been asked as to what use the 'incense-cup' was put. It was suggested by Sir R. Hoare that it was intended to contain perfumes or unguents suspended over the funeral pyre at the time of cremation, so as to disguise the disagreeable odour of the burning corpse.* From the circumstance that vessels of this particular type are generally provided with single or double lateral perforations, and also that they are more or less elaborately ornamented on the under-surface—a peculiarity shared, I believe, by scarcely any sepulchral pottery of other classes—it appears very probable that they were intended to be suspended above the level of the line of sight, possibly at the funereal rites and feasts that accompanied the cremation of the body upon the pyre. But that they served the purpose of 'thuribles' or 'unguentaries' appears to be more than doubtful, for where, it may be asked, could our forefathers have obtained a perfume sufficiently powerful that, if concentrated within a vessel so small as the incense-cup, it could have served the purpose intended? No one claims for these cups that they were *Assyria nardo uncti*, and yet surely the *flora* of Broad Down must have greatly degenerated, if it were possible, in those far off days when cremation was practised, and war-paint was the only personal decoration, to fill a *nardi onyx* from the vegetation of the moor. At present heather, furze, and bracken are its staple products;

Vix humiles apibus casias roremque ministrat.

To revert, however, to the particular example of the 'incense-cup' before us. In this case we are not left to conjecture the use to which it may have been placed, inasmuch as, when it was discovered, it was partially filled with calcined bones. These were so closely compacted together that it could not be supposed that they became located in their present receptacle by accident. Apparently—almost certainly

Albert Way, M.A., F.S.A., *Archæol. Journ.* vol. xxiv. p. 22. See also Sir R. C. Hoare's 'Ancient Wilts,' vol. i. plates 24, 25; *Arch. Journ.* vol. vi. p. 319; Warne's 'Celtic Tumuli,' plates 1, 3; *Intellect. Obs.* vol. xii. p. 263.

* *Ancient Wilts*, vol. i. p. 209.

—they are the calcined bones of an infant, which possibly was buried along with its mother, that it might follow her to that land to which she was gone before, and there enjoy the maternal care of which it was deprived here.

Mr. Bateman observes, 'that the critical examination of all deposits of burnt bones would lead to much curious information respecting the statistics of suttee and infanticide, both which abominations we are unwillingly compelled by accumulated evidence to believe were practised in Pagan Britain.' In reference to this quotation Sir J. Lubbock observes:—'From the numerous cases in which the bones of an infant and a woman have been found together in one grave, it seems probable that if any woman died in childbirth, or while nursing, the baby was buried alive with her, as is still the practice among some of the Esquimaux tribes.' *

At the time of the discovery of this 'incense-cup' it was suggested that the bones were probably not human, but were rather those of some small animal which had been sacrificed at the time of the cremation of the corpse. Unless the bones were removed from their receptacle—which cannot be thought of—it is scarcely possible to determine their character with certainty. It is true that many instances occur in which the bones of animals are found mingled with human bones amongst the contents of tumuli.

In a work before quoted, entitled '*Ten Years' Diggings in Celtic and Saxon Grave-hills,*' the author gives the results of the opening of no less than 237 barrows; and although the remains of animals very commonly occurred, including those of the mole, wolf, dog, fox, polecat, stoat, weasel, badger, wild boar, horse, fallow-deer, rat, goat, sheep, and cow, yet I find but one instance in which it is stated that these remains were burnt; nor can I find any instance, either in the work quoted, or in any other work bearing upon this subject, in which the remains of animals after being burnt were preserved in sepulchral urns.† What Schoolcraft says of the

* *Prehistoric Times*, p. 116.

† 'We have numerous instances where a horse, ox, deer, boar, or dog has been buried with a man.'—'*Notices of the Examination of Ancient Grave-hills in the North Riding of Yorkshire,*' by the Rev. Canon Greenwell, *Arch. Journ.* vol. xxiii. p. 110.

North American Indians is true of our Keltic forefathers:— ‘Nothing that the dead possessed was deemed too valuable to be interred with the body. The most costly dress, arms, ornaments, and implements are deposited in the grave, which is always placed in the choicest scenic situations—on some crowning hill, or gentle eminence in a secluded valley.’ They imagined a future world not altogether unlike the present, and in token of their affection for the dead, they laid by their side those things which in life they had valued most. The same pious feelings prompted them to place food within the grave, and also to sacrifice those animals which had been their companions here, in the hope that they would accompany their owners, and be of use to them in the life which they were thought to continue after death.

The author of ‘*The Primitive Inhabitants of Scandinavia*’ informs us that the missionary Cranz mentions that the Greenlanders, even in his day, used to lay the head of a dog beside the grave of a child, in order that the soul of the dog, which can always find its way home, may show the helpless child the road to the country of souls. Whether this beautiful idea belonged to the Esquimaux or to the missionary is not stated; but, the author adds, it is at all events certain that the skulls of dogs have been found in Esquimaux graves. ‘The rude child of nature has a kind of presentiment, although dim and confused, of a continuation of life after death. But, unable to soar to a purer and nobler conception thereof, he believes that the departed are destined to continue after death the same activity which marked their life in this world. Therefore he builds the same kind of dwelling for the dead as for the living; therefore he places them in the grave in the same position which they were wont to take while alive in their hut, and therefore he hangs up or places beside them the implements of daily use.’ Whilst the experience gathered from the exploration of sepulchral mounds in all parts of the world would thus lead to the expectation that the bones of animals would occur associated in the tomb with human bones, yet the instances upon record of animal bones having been subjected to cremation are rare, and I can find no instance in which such bones were deposited in

sepulchral vessels; these appear to have been devoted exclusively to human remains.

Of the few instances in which these 'incense-cups' have been discovered containing bones, in each case it is suggested that the contents are the ashes of an infant. The Hon. W. O. Stanley describes an interment that was accidentally brought to light on the seashore at Porth Dafarch, Holyhead Island. Beneath a large stone situate upon a hillock, an urn, resembling a beehive in form, was exposed to view; this unfortunately crumbled to pieces. Associated with it was a small vessel of the incense-cup type which contained ashes, and was fortunately preserved. The contents of this vessel were submitted to the late Mr. Queckett, the eminent microscopist, by whom they were unhesitatingly pronounced to be portions of the skeleton of a very young infant. Attention has already been called to the small Irish cup (page 380) as presenting points of analogy with the drinking-cup found in the barrow (A). Its diminutive size approximates it to the incense-cup type; and that it was a mortuary vessel appears from the circumstance that it contained bones which are described as being those 'of an infant or very young child.' It was imbedded in a much larger and ruder urn, filled with fragments of adult human bones; possibly they may have been the remains of mother and child.*

I have already mentioned that this incense-cup was thrown out by the workmen from the trench in which they were excavating without being noticed by them, and that it was afterwards accidentally recovered from among the débris. These little cups are usually found associated with, or enclosed within, larger sepulchral vessels; search was therefore made for the containing urn, but without avail. It was unlikely that so large an object as an urn should have escaped the notice of the workmen, and had it been accidentally broken by them the pieces would have remained. Two or three small fragments of pottery were afterwards found, but as they bore no signs of recent fracture, we concluded that they were shards thrown in upon the grave at

* Catalogue of the Antiquities of the Royal Irish Academy, by W. R. Wilde, M.R.I.A.

the time of burial.* From the position in which the incense-cup occurred I infer that it was originally deposited, along with its containing urn, upon one side of the tumulus, far away from the centre, and probably at an inconsiderable depth below the surface. On the conversion of the Down from pasture into arable the altitude of the barrow was greatly reduced by the action of the plough; thereby the urn, being thus exposed to the vicissitudes of the atmosphere, and to the alternations of drought, damp, and frost, would soon become disintegrated, even if it escaped destruction by the ploughshare; whilst the little treasure that was placed within it, being smaller, and also compacted of better material, was preserved, although its more bulky protector entirely perished. On a consideration of the facts here narrated I was led to conclude that this interment, buried near the surface, far away from the centre of the mound, and partially destroyed by cultivation, was of a later date, and constituted a secondary interment; and although we had excavated the presumed centre of the barrow down to the natural surface of the ground, yet that we had not discovered the primary interment. We therefore commenced our excavations anew by removing all the soil that lay on the north-east side of the centre of the mound; much time and an immensity of labour were necessarily expended in the execution of the work; but at length, after many days, we had the satisfaction of discovering upon the natural and undisturbed surface of the ground a deposit of charcoal so abundant as to form a layer several inches thick, and more than three feet in diameter; fragments of charred oak were plainly discernible, the grain of the wood perfectly retaining its specific character; there also occurred a few pieces of ruddle mixed with fragments of calcined flint and chert, in many cases reduced to powder by the action of the fire. Resting upon this was a compact mass of incinerated bones, forming a deposit about eighteen inches in diameter and an inch in thickness. Careful search was made, but no weapon of stone or metal, no fragment of pottery occurred—nothing,

* Compare on this subject *Arch. Journ.* vol. xxiv. p. 117.

in fact, was found to reward us for our labour. A few flints and flint flakes were brought to light, but I considered that none of them bore unequivocal marks of having been wrought or used by the hand of man. However, we had the satisfaction of knowing that we had at last solved the enigma, and arrived at the original interment; doubtless it was intended to be in the centre of the barrow; that, however, had been lost in heaping up so large a mass of material, and hence our original section through the mound had missed the interment and proved barren of result. The conclusion seems also perfectly obvious that this tumulus covered at least two distinct burials; and inasmuch as the primary interment was entirely destitute of pottery, whilst the secondary interment had this accompaniment, it is quite possible that a long interval may have elapsed between the two burials, and that this mound may have been a time-honoured monument of antiquity when the secondary interment took place.

Our researches were once more resumed, when we discovered, at a distance of about six feet south of the centre of the mound, within a few inches of the surface, and resting upon the layer of capping stones, two large fragments of pottery: as they were devoid of ornamentation, we regarded them as portions of an urn, perhaps that within which the incense-cup was originally placed.

Here ended our exploration of tumulus B.

We now proceeded with the examination of a third tumulus, C, forming one of a group of nine, situate at a distance of about 200 yards to the east of those already described, and occupying a part of the moor that has not yet been brought under cultivation. It is seventy feet in diameter and six feet high. On taking a careful survey of the ground and preparing for operations, our attention was directed by the workmen to the fact that the summit of the mound appeared to 'sound hollow.' We therefore commenced by cutting a trench, four feet wide, in the direction indicated by the men, who worked with great energy in the expectation that their long-deferred hopes were about to be realised, and that the 'crock of gold' with which these barrows are universally associated in the rustic mind, was at length within their

grasp. The periphery of the barrow proved to be formed of burnt earth, extending to a distance of about six feet laterally, and which, being soft and friable, allowed of rapid progress in the work of excavation: there occurred in it a few amorphous fragments of pottery, which appeared not to have formed part of any fictile vessel. We then came in contact with a central mass or cairn of flints which rendered the work of examination most laborious, and the day being now far advanced operations were soon afterwards discontinued. An early opportunity was taken of resuming the work, when we carried our trench through the central part of the mound, whereby we arrived at a knowledge of the plan on which it was constructed. (See Pl. I. fig. 3.) The spot to be occupied by the tumulus was marked out by a circle of large boulders that apparently had been brought from the bed of the stream which flows through the neighbouring valley of Farway; these boulders, some of them so large that they were computed to weigh half a ton, were placed at intervals about three feet apart. Within this inclosure the interments were deposited, and a mass of stones was loosely piled upon them until the mound reached the required height; the whole was then covered with burnt earth to the depth of about a foot on the summit, and more abundantly on the sides, and was finally capped with a layer of surface-earth, so as to give to the barrow a rounded outline, and conceal from view the cairn of stones beneath. The material thus employed in the construction of the barrow rendered its exploration both difficult and dangerous. Owing to the loose manner in which the stones were aggregated, it was necessary to remove them by hand one at a time, and much care had to be used lest the sides should fall in and crush those engaged in the work: in this instance, again, a great expenditure of time and labour occurred. As we approached the middle of the cairn indications of a '*find*' became apparent. Some large flakes of charcoal were observed between the interstices of the stones, and by proceeding cautiously with their displacement we came upon the fragments of an urn that had been crushed by the weight of the superincumbent mass. Probably this occurred at the

time of the original deposition of the urn, for no provision appeared to have been made for its preservation; the surrounding stones had been heaped together without any regard to order, and were too small to admit of their being built into a protecting arch or cist. Around the urn were fragments of charcoal, and patches of black unctuous mould, whilst underneath it was a deposit of burnt bones, free from ashes or any extraneous matter; much care seemed to have been exercised in separating the human remains from the débris of the funeral pyre. But although the urn was much mutilated when disintombed from its long hiding-place, yet sufficient remained to indicate its form, size, and ornamentation. The fragments admitted of being put together so as to form a vessel that would be, if complete, seven inches high, six inches wide at the mouth, and seven inches wide at the base of the rim, which is overhanging, and is five-eighths of an inch wide. (See Pl. VII. fig. 1.) Below the rim the vessel swells out for two inches, and here it is nearly eight inches in diameter; it then contracts towards the base, which is three inches in diameter. The ornamentation of the urn, if that term is admissible, is of the rudest character; the exterior is quite plain, with the exception of a single horizontal line made by impressed cord or thong which encircles it at that point where it attains its greatest diameter; the surface of the rim is filled in with diagonal and horizontal lines that form an approach to the zig-zag pattern so common in the earlier examples of British mortuary pottery (Pl. VII. fig. 2). The exterior edge of the rim is punctured by large dots or indentations at irregular distances, which appear to have been made with the point of a stick. The material of this vessel is in harmony with the rude character of its decorations. The paste of which it is compacted consists of red friable clay, without any intermixture of coarse sand or gravel, and is very imperfectly baked;* the fragments are brown or light red externally and black within, the walls are

* It is a mistake to suppose that the pottery which we find in ancient grave-mounds is under any circumstances sun-baked: unless the clay is previously hardened by exposure to the action of fire, it would soon revert to its original unctuousness.

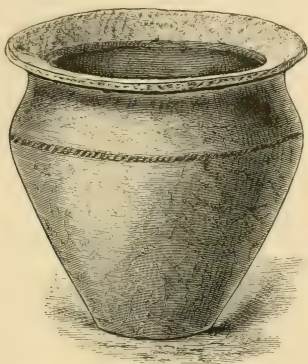


FIG. 1.—CINERARY URN (RESTORED), FOUND IN A BARROW AT BROAD DOWN.
($\frac{1}{4}$ Orig. size. Albert Memorial Museum, Exeter.)



FIG. 2.—FRAGMENT OF URN, SHOWING THE ORNAMENTATION OF THE RIM.

(Orig. size.)

R. Kirwan, del.

rough and clumsy, whilst the base of it is nearly an inch in thickness; the irregularity of the form of the vessel would also betoken that it is hand-made, and was not moulded on the potter's wheel. Scattered among the materials of this barrow we afterwards found several other fragments of pottery, which exhibited a remarkable diversity in quality of workmanship; for whilst some were as rude and clumsy as the vessel just described, others were thinner, well-tempered, and of finer texture. Some pieces of these were rough upon the surface; and of a dark brown colour; others were of a dingy black hue, as if begrimed with the smoke and soot of the funeral pyre; others again were of reddish hue and were well-baked, being almost as thin and light as modern pottery; in many cases the edges of the fragments exhibit numerous small pebbles or dark-coloured gravel, which was probably mixed with the clay to give it consistency; some particles are still adherent to the surface in different places; in almost all cases the interior of the material, as shown by the fractured portions, is black.* Our work now proceeded for some days without interruption, until the mass of stones was removed from the whole of the interior of the mound, so as to form a clear space about twenty feet in diameter. No indications of a further deposit were arrived at, until, on the east side of the barrow, near the edge of the cairn, about eighteen feet distant from the centre, and as we approached the circle of boulders, the presence of an interment was again indicated in the shape of a layer of burnt bones, resting upon the flints, two feet above the natural surface of the ground, and unaccompanied by ashes or any foreign material. At a short distance to the east of the bones, and protected by a rude dome of flints, was an earthen vessel belonging to the class known as 'food-vessels,' and apparently almost perfect in form.† Aware of the destructive influence that a sudden

* 'The paste (of which the cinerary urns found in Keltic barrows is compacted) consists of the clay found on the spot prepared without levigation, consequently coarse, and sometimes mixed with small pebbles, which appear to have been added to hold it compactly together.'—Birch's '*Ancient Pottery*,' vol. ii. p. 379.

† See Bateman's '*Classification of Vessels exhumed from Keltic Tumuli*:' '*Ten Years' Digging*,' Appendix, p. 281.

exposure to the atmosphere exerts upon these ill-baked vessels, and knowing the difficulties that would attend the endeavour to remove the example before us, I proceeded at once to take measurements and to make a sketch of it as it lay *in situ*. Nor were our precautions in vain, for in the course of a few minutes, before we had even time completely to uncover the vessel, we had the mortification of observing it crumble into fragments. The general character of this vessel may be ascertained by reference to Plate VIII. fig. 1, whilst a fragment of it exhibiting the style of ornamentation is represented in Plate VIII. fig. 2. It seems to have measured about seven inches and a half in height, four inches and a half in diameter at the mouth, and five inches in diameter at the part where it bulges out; it is of a pale red colour, compacted of a paste that is of a closer texture than that of the urn, and has some approach to gracefulness of form and contour. The edge of the lip of this vessel is slightly bevelled on the outside, and is ornamented with a single row of incised perpendicular markings or notches at regular intervals (Plate VIII. fig. 2). The style of ornament peculiar to this example of the 'food-vessel' is very simple, consisting of horizontal rings or bands parallel to the rim, and encircling the vessel at regular intervals like a series of hoops. These markings appear to have been incised upon the clay whilst it was soft, and were wrought by some narrow grooved instrument, probably of wood. The scoring is uneven; in several instances the two ends of the encircling hoop overlap one another without quite completing the circle; whence we may infer that the ornamentation is the handiwork of an artist who had not the assistance of a potter's wheel. I have termed this a 'food-vessel' rather than an urn, both because it was empty when it was found, and also because the projecting rim, which has been mentioned as characteristic of the urn that contains burnt remains, was absent in the case of this vessel. Another distinction between the 'food vessel' and the urn may also be pointed out, namely, that whilst the ornamentation of the urn is almost exclusively confined to the rim, that of the 'food-vessel' extends over its entire exterior surface.

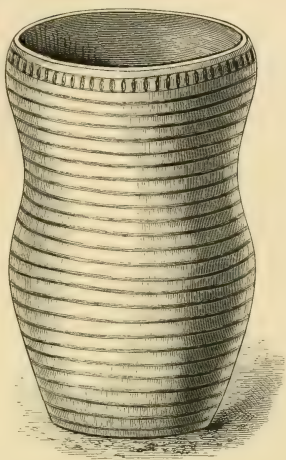


FIG. 1.—FOOD-VESSEL (RESTORED), FOUND IN A BARROW AT BROAD DOWN.
($\frac{1}{3}$ Orig. size. Albert Memorial Museum, Exeter.)



FIG. 2.—FRAGMENT OF FOOD VESSEL, SHOWING THE CHARACTER OF THE
ORNAMENTATION.

(Orig. size.)

We continued our researches to the extremity of the stone cairn, and also removed some of the larger boulders that have been mentioned as forming its periphery, but nothing further was found.

Such then are the particulars of the exploration of the three tumuli at Broad Down that have come under observation, the narration of which I have endeavoured to compress within the narrowest limits that a faithful description would admit of. One or two questions arising out of the facts that were then observed naturally suggest themselves, and to these I propose now to endeavour to furnish a reply.

Where, however, opinion amounts to little more than conjecture, based as it is upon negative evidence in part, or upon facts that are obscure and of doubtful interpretation, I shall express that opinion with diffidence and reluctance. The question of primary importance is this — To what people, and to what period are these barrows to be ascribed? This is a question the solution of which is attended with difficulty. In seeking to furnish a reply to it there are several points which require consideration. The first of these which may be mentioned, is the mode of interment. We find at Broad Down remains bearing the marks of unquestionable antiquity, and which have certainly been exposed to cremation. Now barrow-burial, with its accompaniments, appears always to have held a prominent position amongst the funereal rites of a Pagan people; but, as soon as that people embrace Christianity, their long-established customs, repugnant rather to Christian sentiment than to Christian doctrine, do not long survive their conversion; the old methods of interment are gradually modified, and cremation yields to inhumation. If the correctness of this inference be allowed we shall at once be able to refer these remains to a period antecedent to the first introduction of Christianity into this island, under the Romans, in the second or third century. This inference is confirmed by a comparison of the mode of burial with which we are here familiarised with that in common use among the Saxons. Occasionally indeed cremation appears to have been practised by that people; but by far the more usual custom among them

was to dig a grave or cist into the ground to the depth of several feet, and to raise a mound of low altitude over it. The Saxon graves too, instead of being comparatively barren of relics as are the tumuli of Broad Down, abound with traces of human art; they form in fact an archæological mine from which are dug out weapons and personal ornaments of all kinds, including articles of leather elaborately ornamented with silver or enamel, helmets, spears, shields, swords, daggers, and other weapons; beads of amber, glass, and crystal, whilst brooches, rings, ear-rings and bracelets of gold, silver, and copper form but a small portion of the catalogue.* Once more, the entire absence of coins, pottery, or weapons, that bear the impress of Roman art, such as are constantly found in Roman tombs, tend so far to prove that these tumuli were not raised by that people, who indeed seldom commemorated their dead by so ambitious a memorial as the barrow.

On the other hand the antiquities associated with the tumuli that have been described agree in all respects with the characteristics presented by other barrows that have been explored in different parts of the kingdom, and which are generally accepted as of Keltic origin.

The shape and size of the mounds, the mode of their formation, the cremation of the interments, the form, the quality, and the style of ornamentation of the accompanying pottery, all point to the conclusion that these barrows are the sepulchral remains of a people that inhabited this spot many ages before the time of the Roman invasion. One more link in the chain of evidence is supplied by a comparison of the drinking cup found in tumulus A (Plate II. fig. 1), with the gold cup found at Rillaton (Plate III. fig. 1), and the amber cup found at Hove near Brighton (Plate IV. fig. 1). The general style and character of these three cups, their similarity in regard to form and size, the ovate form of the bowl which is shared in some degree by them all, the smallness of the handle, intended rather for suspension than the insertion of the finger, the ornamental parallel lines that encircle the

* See an article entitled 'The Saxon Grave-mounds and their Contents,' by Llewellyn L. Jewitt, F.S.A., 'Intellect. Obs.' vol. xii. p. 459.

bowl, and the perpendicular lines that edge the handle in each of these rare and interesting relics, all these peculiarities imply a certain constructive analogy, and point to the conclusion that they belonged to members of one and the same people, or of tribes that were cotemporaneous, and who lived under much the same conditions. Now we know that the Cornish treasure-trove as well as the Brighton treasure-trove were associated in the burial-place with a weapon of bronze, so that in the case of these two relics we cannot err if we attribute them to the Bronze Age. Moreover, the absence of pottery in the burial with which the Broad Down cup was found also leads us to assign that relic to a remote period;* whilst upon the other hand the absence of bronze in that tumulus by no means implies that this metal was unknown when the interment took place. The finding of bronze objects with burials is extremely rare.† For a long period after its introduction this metal appears to have been employed only for more important articles. Bronze being of necessity expensive, and probably imported from abroad,‡ the poorer classes would continue for a long series of years to employ stone as their material for general use; and probably the rich in addition to their bronze implements frequently used others of stone, and especially in cases that would have consumed a large quantity of material in their fabrication. Thus the absence of bronze, in the case of the tumuli under consideration, may be accounted for, both by its liability to decay, and also by the fact of its intrinsic worth, which would render it too valuable to be hid away in a grave-mound along with the dead. However, we have evidence that bronze has been found associated with burials in barrows belonging to this group, and in immediate proximity to those that we have lately examined. About a hundred years ago a ‘stone barrow,’ the mode of construction of which

* I may here cite the authority of Sir R. C. Hoare, who says that ‘simple cremation was probably the primitive custom. The funeral urn, in which the ashes of the dead were secured, was the refinement of a later age.’

† Articles such as swords, spear-heads, and celts, which were of bronze, appear only on the rarest occasions to have been interred with their owners.—Canon Greenwell in *Arch. Journ.* vol. xxii. p. 256.

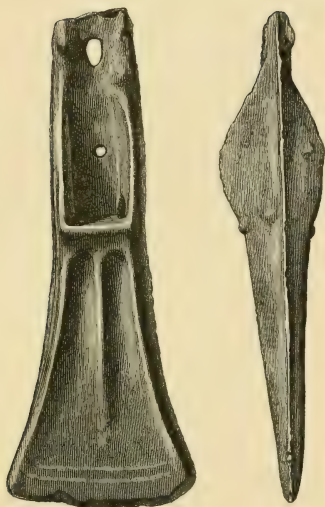
‡ ‘Britanni ære utuntur importato.’—Cæsar, ‘*Bell. Gall.*’ v. 12.

appears to have been identical with that represented in Pl. I. fig. 3, was destroyed, and at the same time a collection of bronze spear-heads, amounting to half a wheel-barrow full, was discovered.* By far the larger portions of these were carried into the neighbouring town of Honiton, and were there sold as old metal. At present one only is known to be in existence; it is in the possession of Dr. Snook of Colyton. It is of a common type, known as the palstave, and is figured in Plate IX. figs 1 and 2.

I am indebted to a friend for the following extract from the diary of the late Matthew Lee, Esq.:—‘July, 1763. The labourers on Lovehayne farm, Colyton, near Southleigh, destroyed a stone barrow in order to procure a supply of stones for the new turnpike road. Upon one side of the barrow they found about a hundred Roman chisels for cutting stones, of a metal between a copper and brass colour, rough and unhardened.’ It is possible that, as has often occurred, there were spear-heads mixed with the objects familiarly called ‘celts or chisels.’ They are properly to be described as ‘palstaves,’ of the type without any side-loops. It is by no means improbable that this was one of those remarkable hoards or deposits buried by some itinerant manufacturer of bronze implements and weapons. The single specimen preserved agrees well with the description given in Mr. Lee’s diary, being a somewhat defective and unfinished piece. The rough seams at the side, left by the divisions of the mould, have not been trimmed off.

Here, then, we have evidence which will enable us to arrive at an approximate date for these barrows. Upon a survey of these facts I see no difficulty in assigning a high antiquity to the relics that have been lately brought to light, or in considering them as the remains of a people who flourished long before the advent of any historic race. Taking all the circumstances into consideration we must assign them to a period antecedent to the Roman invasion of Britain, and probably we shall not err if we refer them to a period far more remote, when bronze, though known, was scarce,

* Davidson’s ‘Notes on the Antiquities of Devon,’ p. 73.



WINGED CELT OR PAALSTAVE OF BRONZE, FOUND IN A BARROW AT LOVE-
HAYNE, NEAR BROAD DOWN, ABOUT A.D. 1760.

($\frac{2}{3}$ Orig. size.)

Reproduced by permission of Albert Way, Esq., F.S.A.

and when its use was confined to the wealthier part of the population.

I have ventured to put forth these conjectures, at the same time that I have stated the reasons on which they are based, because it would appear as if some degree of theorising is required in order to reconcile and explain isolated facts; and whilst I do not claim universal acceptance for the conclusions at which I have arrived, yet they will be so far useful if they provoke discussion, which is the road to truth, and which ought to be the object of all investigation. I am fully aware that before we can pronounce with confidence upon any of the important points that have been raised in these pages, more extensive researches must be carried out. Up to the present time no cranium has been discovered to supply a cephalic index, whereby a knowledge of the general type of race to which these people belonged may be arrived at. It is worth any pains, however, to establish such a fact if possible, for the determination of the cranial type would enable us to draw trustworthy conclusions, and is exactly that which is required to dispel the mists that still enshroud the prehistoric period of East Devon archæology.

I have great pleasure in expressing my thanks to Mr. Albert Way, to whom I am indebted for many suggestions. It is through the kindness of the same friend that Plates III., V., and IX. have been placed at my disposal for the illustration of this memoir by the Central Committee of the Royal Archæological Institute, and also Plate IV. by the Sussex Archæological Society.

PREHISTORIC REMAINS IN VALENCIA.

BY DON JUAN VILANOVA Y PIERA.

Valencia del Cid, 20 août 1868.

A MONSIEUR FRANKS.—Mon très-cher et honorable collègue, —Puisque des affaires de famille m'empêchent d'assister au Congrès cette année-ci, permettez-moi de vous adresser quelques observations relativement à la géologie préhistorique que j'ai pu faire dans plusieurs localités de la province de Valence, mon pays natale, pour les communiquer au Congrès à Londres.

D'abord vous savez que j'ai constaté, dans la réunion de l'année dernière à Paris, le résultat de mes recherches dans les cavernes de Moncluses, de la Cueva Negra, près de Jativa, de celles de Favimes, de Valldigna et autres, appartenant toutes au premier âge de pierre. Parmi elles la plus intéressante est, sans doute, celle appelée De las Maravillas, située dans la circonscription de Gandia. Dans un limon noirâtre, qui atteint plusieurs mètres de profondeur dans la base de la caverne, se trouvent des instruments du premier âge, parmi lesquels figurent de très-belles flèches, parfaitement identiques à celles des palafittes suisses, mêlées à des ossements fossiles de plusieurs mammifères éteints, et quelques coquilles fluviatiles et terrestres appartenantes à des espèces encore vivantes. Dans le tiers supérieur de ce dépôt on voit, mêlés à des ossements plus récents, des fragments de céramique romaine. La description détaillée de toutes ces grottes paraîtra prochainement dans les 'Annales du Musée de Madrid,' et je me ferai un devoir de vous en adresser quelques renseignements.

Maintenant je viens de faire une course dans le Val d'Albaida et dans le territoire de Lombay, et je vais vous faire un bref résumé de ces recherches. Tout près de la ville de

l'Olleria existait un grand tumulus, lequel fut exploré et presque entièrement détruit, il y a plus de vingt ans, par M. Joseph Pla, à la recherche, comme toujours, de grands trésors. Ce tumulus se trouvait placé sur l'extrémité plate d'un des derniers accidents de la chaîne appelée Serra Grossa, qui sépare le Val d'Albaida de celle de Montesa et Jativa : ses dimensions étaient véritablement remarquables, car la circonférence à la base n'avait pas moins de 100 mètres et la hauteur dépassait 10 mètres. La structure du tumulus était celle-ci : à la base une rangée de grosses pierres couvertes de plus petites pierres et de terre ; au-dessus venait une autre rangée de pierres de plus petites dimensions, couvertes aussi de terre ; une troisième rangée de pierres et de terre succédait à l'antérieure, et successivement jusqu'à la partie supérieure, qui était couverte par la terre à brique, comme le reste du tumulus. Le trésor qu'on cherchait n'a pas encore paru, mais la véritable richesse scientifique qu'on trouva—et remarquez bien la date de la découverte (1858)—fut sept squelettes humains complets, des haches polies de très-belle diorite, une série de coins en bronze de plusieurs dimensions, et une grande quantité de poterie grossière noircie en dedans et rougeâtre en dehors. A peu près vers le milieu du tumulus on trouva une couche de cendre gris de plus d'un mètre d'épaisseur dans toute l'étendue du tumulus. Près d'un autre village, appelé Ayelo de Malferito, à une lieue de l'Olleria, existe aujourd'hui un autre dolmen exactement semblable à celui exploré par M. Pla, placé aussi à l'extrémité plate d'un chaînon de la Serra Grossa, avec les mêmes dimensions et la même structure que celui-là. Je l'ai visité, et le commencement de son exploration m'a donné comme résultat quelques fragments de poterie grossière comme dans l'autre, et quelques dents de cerfs qui n'existent plus dans le pays, et qu'on trouva aussi dans celui de l'Olleria. Autour de ce dernier existent deux ou trois tumulus plus petits, mais évidemment construits par la même race. La plupart des objets recueillis dans le tumulus de l'Olleria, appelé dans le pays 'Monton de Tierra,' ont disparu, exceptés quelques morceaux de mâchoire humaine inférieure avec les dents très-bien conservées, quelques dents de cerfs et d'autres

mammifères, des fragments de poterie, et deux haches en pierre polie et en bronze.

J'ai visité aussi la grotte S. Nicolas, située dans le calcaire crétacé à l'Olleria, et dans lequel le même M. Pla fit des recherches il y a dix-huit ou vingt ans à la recherche de minerais qu'il ne trouva pas. Cette caverne appartient, comme les autres que j'ai pu explorer dans la province, à la première époque de la pierre, ayant trouvé parmi les débris quelques silex taillés mais sans polissage, plusieurs dents et ossements de mammifères éteints, et deux ou trois fragments de coquilles marines et d'eau douce.

Dans la caverne de Matamon, près de Lombay, à six lieues à l'ouest de Valence, exploitée aussi depuis vingt-cinq à trente ans dans l'espoir de trouver, comme toujours, des trésors, j'ai pu ramasser des outils en silex non polis, deux haches polies en diorite, un fragment de mâchoire humaine, avec une dent molaire, dents et ossements de cerf, deux *Cardium edule*, deux *Pectunculus pulvinatus*, un *Dentalium entale*, morceaux de *Pecten Jacobæus* et *maximus*, grand nombre de *Helix nemoralis*, et quelques *Melanopsis Dufaurii*. Quelques pièces romaines, parmi lesquelles il y avait une de Faustine, très-bien conservée, prouvent que cette caverne contient des monuments de deux époques, de la pierre et d'une autre bien plus moderne.

A part ces explorations dans le territoire de Valence, j'espère que mon ami Tubino vous fera connaître tout ce que nous avons vu à Cordoue, à Xerez, dans la province de Badajoz, où il y a plusieurs *cromlechs* appelés dans le pays *las garitas*, et dans lesquels on a trouvé des ossements humains mêlés à d'autres mammifères, et avec des haches polies en diorite. On a trouvé aussi d'autres haches et ossements à S. Isidro, près de Madrid, des haches en diorite à Imon, province de Guadalajara, à Villaro, et dans bien d'autres localités.

Tout à vous de cœur,

JUAN VILANOVA.

ON THE CONNECTION OF THE PREHISTORIC AND THE HISTORIC AGES IN WESTERN ASIA.

BY HYDE CLARKE, ESQ.

THE meeting of the Prehistoric Congress appears a desirable opportunity for making some remarks on the progress of the researches I have for some years carried on for the purpose of ascertaining the origin of the former and existing populations in Western Asia. In order to do this as succinctly as possible, I shall endeavour to avoid proofs and details, referring the members to what I have already published.

Working back from the Historic or Hellenic period, we have obtained two results in Asia Minor. One is that the rock-cut monuments of that peninsula do not belong as supposed to the Egyptians, but to an undetermined epoch allied in its artistic character to the Assyrian. This I have named Lydo-Assyrian, but M. Perrot and the French authorities term it Lydo-Phrygian.

The second result is the determination by me of an Iberian population in the western portion of Asia Minor, that is, a population identical with the race in Spain which William von Humboldt connected with the present Basque population. These Iberians I find to have occupied Spain, Italy, Greece, and Asia Minor, as well as Gaul and possibly Britain and Ireland.

The question arises, How did the Iberians get into Europe? and the solution is to some extent indicated. They could not have come from the East through Asia Minor, as, on the contrary, they were penetrating into that district when checked there by the Hellenic invasion, for the main seats of these Iberians I find to be in Western Asia Minor. If this be correct, the Iberians must have entered Europe like the Indo-Europeans, the Hellenes, and the Celts, and have penetrated

the peninsulas from the north, unless the Iberians came from Africa, for which hypothesis we have not at present any authority.

My evidence is obtained, like that of William von Humboldt, from the topographical nomenclature or names of places; and this early showed me that the names of the oldest seats of population are not Hellenic or Iberian. I have pointed out that these places, according to traditions, are generally of Amazon foundation.

The traditions of the Amazons are so mixed up with fable, that though they have in the last two centuries occupied many learned men, they appeared to offer no solution; and the endeavour to unravel the matter seemed to be a hopeless task, for the materials in Western Asia Minor are very scanty, and disfigured by Greek and Roman interpretation. I found at length that the ancient topographical nomenclature of Pontus, Cappadocia, Colchis, and the Caucasian countries has distinct elements; that these elements present analogies with the languages now spoken in those countries, the Georgian, Lazian, Suanic, &c., and also analogies with the Amazon names of the West. Those countries were the seat of the main Amazon kingdoms.

I have been therefore driven to a solution, which is that which appears most in accordance with the facts and traditions. Amazon was the name given possibly by the Iberians to the pre-Iberian population of Asia Minor, with which they contended for empire; and in later ages 'Amazon' acquired fantastic Greek interpretations of 'breastless,' &c., engendering fertile crops of fable. The Amazon population had founded the cities from many of which they were expelled by the Iberians, while the hills were filled with Chalybes and other low tribes possibly related to the lower tribes of the Caucasus. This mixture of race facilitated the inroads of the Iberians, and also facilitated their fall, and Western Asia Minor fell a prey to the inroads of bands of Ionians, Dorians, and Æolians, though long preserving a varied barbarian population. I explain the existing varieties of so-called Greek and Yuruk populations by the ethnographic differences between the several races of barbarians, not supposing

that any Greek blood remains in Asia any more than in Greece. (See Fallmerayer, Finlay.)

This identification of the Amazons necessarily connects them with the Caucasian tribes, in the classification of which I have long laboured. Confirming the suggestion made by our great Tibetan and ethnological authority, Bryan Hodgson, I find the Georgian languages distinctly connected with those of Tibet. I have this year established the connection between the Georgian and the Cherkess or Adighé, thereby throwing further light on the Tibetan affinities. (See *Athenæum*.) Since that determination I have been able to ascertain the affinity of the whole of the languages of the Caucasus, except the Ossetinian, determined by Klaproth. The result confirms the hypothesis of Prichard, as to the probability of their alliance, and it explains the reason for which this group has so long resisted the attempts at classification, because the affinities exhibited are not with each other, nor are they even restricted to one class, as the Tibetan, but extend to all the classes in South-eastern Asia—Burmese, Cochin Chinese, and Chinese.

These relationships of language point to a community of association, if not of origin, in the cases of some tribes, and they refer to association at a most remote period, before the separation of the Caucasian group from the Tibeto-Chinese.

What may be considered an important result is this, that we obtain a proof of the passage of a great population from east to west, for the migration of the Aryans is at this moment a pure hypothesis. The Caucasians must have been derived from the south-east, and not the Tibetans and Chinese from the Caucasus, because the facts show that the Caucasian languages must be classified within the Tibeto-Chinese.

If my suggestion of the former continuous area of the larger and smaller group be correct, then the site of the great historic empires must have been thus occupied, and we find claimants for this civilisation, anterior to Nineveh and Babylon, the Assyrian and the Mede.

With regard to the western bounds of the Caucaso-Tibetan

or Amazon migration I am not in a position to give any decided opinion ; but I am disposed to anticipate the confirmation of the legend of Amazons in Greece, and possibly in other countries of Europe.

As to the pure ethnological questions of the connection of the populations as well as of the languages that have to be investigated, the philological connection (involving historical facts which speak for themselves), and their development and adjustment, must be left to future researches. The Georgians present a particularly exceptional type, but may represent an Iberian or Indo-European tribe, leading an invasion as conquerors and acquiring the language of the subject population. So far as I have been yet able to observe I am far from rejecting the possibility of the ethnological identification of some of the lower tribes of the Caucasus with some in the Tibetan area.

The establishment of the Tibetan relations of the Caucasians, which is now beyond the possibility of being assailed or disproved, will in due time exercise its influence on our views of the historic and social position and mythology of the races of Asia Minor and Western Asia. The hypothesis, now so favourably received, of an Aryan origin and Sanskrit explanation of classic mythology will have to be reviewed, and so will the tradition of a northern descent of the Hebrew and Aramean branches of the Semites. The present aspect of the facts is very unfavourable to these theories. The mythology of Ionia is localised, independent, or pre-Hellenic, and, if so, pre-Indo-European. The histories of the floods of Noah and Deucalion, if localised in the west, are not necessarily of that origin, nor Semitic, nor Indo-European. The appearance, indeed, of both these families on the pre-historic or historic scene must be relatively late and new. The discovery of these legends in Tibetan and Dravidian districts now assumes importance as evidence. There is a Sontal parallel of the Noachic flood in Hunter's 'Rural Annals of Bengal' particularly deserving attention.

If the Semitic race did not descend from the Caucasian districts to the south, but proceeded from Africa to the north, we may be led to attribute the period of the adoption of the Noachic chronicles to the Babylonian captivity, and we must

seek a more remote origin than an Aryan one for the mythology and legends of the Hellenes and Ionians.

For all these reasons it appears to be of great importance to get beyond the district of Aryan and Semitic influences by which we have hitherto been confined, to cultivate the earlier sources of prehistoric studies in Tibetan and Dravidian, and indeed generally to extend our studies in comparative philology as we are doing in archæology.

One result of our present researches is to carry back the era of civilisation beyond the old hypothesis of historic civilisation, accumulating at the same time material and philological evidences. Prehistoric studies are not limited to the history of savages, but carry back the history of civilisation. In every respect much has to be done; we want to discover more monuments, we want to learn to what populations we are to attribute these monuments.

In consequence of the discoveries at Santorin I beg again to call attention to my suggestion, that the so-called fossil oyster beds on Mount Pagus at Smyrna belong to the class of kitchen-middens. It appeared dangerous to attribute a high antiquity to the strata of pottery, but there now remains no objection under this head.

With regard to the discoveries at Santorin, they are so closely connected with the subject in hand that a few notes are here given, not from my own observations, as I was unfortunately prevented from going to Santorin, but from the accounts of various persons, as the Baron des Granges of Athens, M. F. Lenormant, and others. M. des Granges has given me a photograph of some of the remains, which I send herewith. It is the same published by M. Dumont at Paris.

The volcanic group of Thera, or Santorin, consists chiefly of the larger portion of the old crater Thera, and the portion of the western side, Therasia. The latter has been greatly worked for puzzolana for the railway works in Asia Minor and the canal works at Suez. When the late eruption took place, producing the volcano of King George, the attention of the French, Prussian, and other missions was directed to the result of the great puzzolana excavations in Therasia or Terrasia, which had laid bare the foundations of a house.

The site is at the south-west or outermost point or corner of Therasia, high up under a stratum of puzzolana underlying a stratum of lava. The foundations of the house include the walls of three rooms, according to the sketch of M. des Granges. The objects discovered were two pieces of a human jaw, various objects of pottery, and a flint saw. Besides these objects, more pottery and many implements of obsidian were found. The knives, according to M. Lenormant, are exquisitely polished. There are specimens at Paris. The pottery consists of two kinds, coarse ware, supposed to be of local origin, and decorated pottery, made in the potter's wheel and supposed to be imported. One of the most curious objects was a bead of native gold, apparently hammered cold with a stone hammer.

The walls of the house are said to be of a stone, now foreign to Therasia; and it was roofed with rough wood; according to M. Lenormant, of the wild olive, now not existing in Therasia, but, according to M. des Granges, of cypress.

The destruction of the original island of Thera took place before the historic era, and there is no tradition of it. The habitations and objects discovered must therefore be of remote antiquity and prehistoric.

ON THE PREHISTORIC MONUMENTS IN THE ISLANDS OF
MALTA AND GOZO.

BY P. FURSE, ESQ.

(*D. Assistant Commissary General.*)

AMONG the most interesting relics connected with prehistoric archæology must be reckoned those existing in the islands of Malta and Gozo; and the first attention of the Society of Archæology, History, and Natural Sciences, founded in Valetta in January 1866, has been directed to the study of these monuments.

Those of Gozo and Marsascirocco have long been known to the archæologist. The former is called the Giants' Tower, and has been described by Houel,* General della Marmora,† and other authors. Monsignor Brès‡ and Dr. Cesare Vassallo§ are of opinion that it was a temple dedicated to Astarte.

Ptolemy,|| among many others, has written about the second, which was of great importance; and Houel has portrayed a very good view of a portion of its ruins; but it is now in a very dilapidated condition. Some parts have been built up as division walls, to separate the fields of different owners, while a portion has been converted into a cattle shed.

That two others, situated near the village of Krendi, are in better state of preservation, is due to the fact of their having been excavated only thirty years back.

The colossal stones, raised in semicircular form on this and other parts of the island, and which could not be attributed to accident, had for a long time attracted the curi-

* Voyage pittoresque des îles de Sicile, etc. Paris, 1782.

† Lettre à Raoul Rochette, page 1^{re}, Nouvelles annales de l'Institut Archéologique. Paris, 1836.

‡ Malta antica illustrata. Roma, 1816.

§ Art Journal, 1853, p. 221.

|| Claudii Ptolemæi Geographia, lib. viii. c. 3.

osity of all who beheld them, and the interest of antiquaries. Houel, who wrote half-a-century before any attempt was made to ascertain what lay buried at the foot of these landmarks of antiquity, had not failed to call them a part of some monument of the greatest importance, and belonging to a very primitive period.

When, therefore, in May 1839, His Excellency Sir Henry Bouverie, Governor of Malta, authorised the Collector of Land Revenue to undertake excavations on this spot, and the work resulted in the discovery of a well-preserved monument of the greatest interest, the admiration was considerable; but no surprise was felt at the general surmise having been realised.

The success of the excavation at Hhagiar Kim encouraged the Governor to further explorations at a spot half-a-mile nearer the coast, which gave similar indications of remains of this kind lying imbedded under the large stones, standing, or rather protruding, out of the surface of the soil. The Mnaidra monument was the result.

Great regret must be felt by all interested in bringing to light all that pertains to a nation of which so little is known as the Phœnicians, and to which these monuments appear undoubtedly to belong, that no record was kept by the government officers of the progress of the discovery. Nor did the finding such important relics obtain more than a passing attention from the local press of the time.

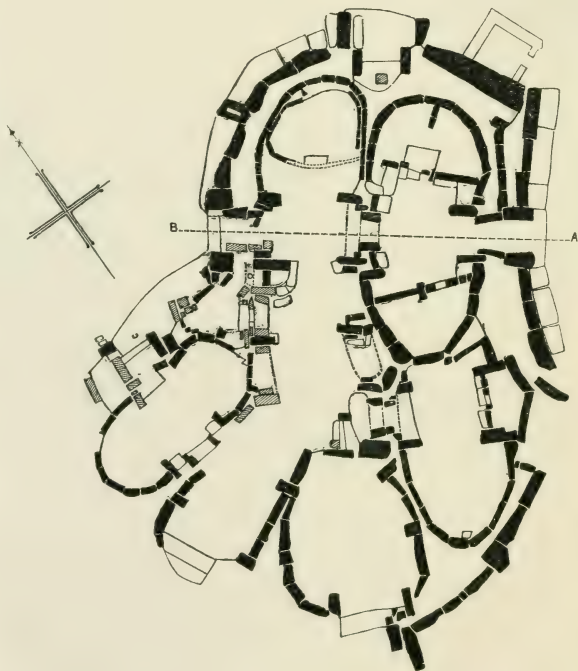
Some sections of the ruins, as well as a sketch of the ground-plan of Hhagiar Kim, taken by Lieut. Foulis, 59th Regiment, were published in the 'Malta Penny Magazine,' of May 1840; but the description of the monument undertaken in No. 34 of that periodical, was never completed.

A communication was, however, made in 1840 to the Society of Antiquaries of London, by Mr. J. G. Vance, which is printed in the *Archæologia*, vol. xxix. p. 227, in which Lieut. Foulis' plan is reproduced with various views of the ruins.*

Some years after, Dr. Cesare Vassallo, F.S.A., and vice-

* For other notices of these remains see Gerhard, '*Archäologische Zeitung*,' 1848, p. 346; *Archæological Journal*, vol. ix. p. 299, vol. xiii. p. 397; Newton, '*Travels and Discoveries in the Levant*,' vol. i. p. 4.

PLAN
of the
RUINS
of
HAGIAR KEM
MALTA



president of the Society of Archæology of Malta, wrote a pamphlet on the Phœnician, Greek, and other antiquities of Malta, which included the ruins of Hhagiar Kim and Mnaidra.*

The first step taken by the Society of Archæology in Malta has been to have a plan of the Hhagiar Kim remains carefully taken (Pl. I.); and to obtain photographic views of those portions of the Giants' Tower, Temple of Melcarth, Hhagiar Kim, and the Mnaidra, which show in the most effective way the style of building adopted and the details of the monuments. To these have been added those of the altar, of the sacred slab, and of seven statuettes, all found at Hhagiar Kim, but removed for better custody to the museum annexed to the Public Library of Valetta.

This work, confided to Colonel Collinson, R.E., president, and to myself as secretary of the society, resulted in the collection of the twenty-one views (including a photograph of the plan taken) a copy of which I now do myself the honour of laying before the Congress.

Colonel Collinson is continuing the work undertaken, and it is to be hoped that next year the plan of the Mnaidra, already commenced, and other additions, will be made to the collection.

The description of the ruins of Hhagiar Kim will alone be the subject of the present memoir; and, while following the details of the plan, the arguments adduced to prove that they were those of a Phœnician temple will be discussed.

So much has been already said in proof of the Phœnicians having colonised Malta at a very early period, that it is unnecessary to enter into this question; and the writings of Ptolemy, Diodorus Siculus,† and others, have recorded that a temple to MELCARTH, the *Phœnician Hercules*, had been

* Art Journal, 1853.

† Diodorus lived 60 B.C., and in lib. v., speaking of Malta, this historian says, 'The inhabitants are a colony of the *Phœnicians*, who, trading as far as the *Western Ocean*, resorted to this island on account of its commodious ports and convenient situation for a sea trade; and by the advantages of this place the inhabitants presently became famous both for their wealth and merchandise.'—Translation by G. Booth, London, 1700.

erected by the colonists of this nation in Malta, while many authors are of opinion that the celebrated temple of JUNO, of which Cicero speaks in his peroration against Verres,* was originally a temple dedicated to ASTARTE.

The principal entrance to Hhagiar Kim is from the south-eastern aspect, and, on entering the inclosure, visitors are at once struck with the uniformity adopted in building the several chambers which are all of an apsidal form.

This shape is repeated in the symbols carved in the stone altar and sacred slab, found in these ruins, as well as in the forms of the seven statuettes (Plate II.), likewise discovered at Hhagiar Kim, and in the numerous perforations which cover the greater portion of the stones of this building.

Each nation, as is well known, has adopted a peculiar construction in the building of its temples; and when the fact is known, that, under the shape of an egg, the Phœnicians adored the universe, while the worship of the procreative power, under the semblance of two serpents joined together, formed part of the cosmogony of that nation; and that these emblems are found carved in the altar and sacred slab; and that they are reproduced in the construction of the chambers, there would seem to be conclusive evidence to show that this monument was erected by the Phœnicians.

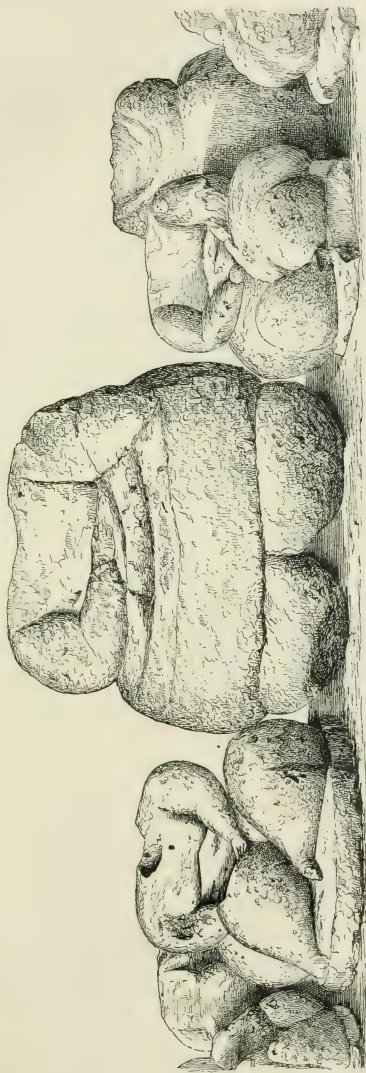
Another proof that Hhagiar Kim was a temple, and that in all likelihood it was dedicated to the seven Cabeiri, is found in the fact that the name of the place translated from the Maltese, a language containing many remains of the Phœnician, signifies STONES OF WORSHIP; and that, a few centuries back, a village called RAHAL KBIR † still existed on this spot.

It is proved that this was a small village, and that therefore the appellation of KBIR given to it, which in Maltese, as well as in the Phœnician language, signifies *great*, could not have been given on account of its size. Some other reason influenced, therefore, this denomination; and the explanation is found in the fact, that a temple dedicated to the Kbir or Cabeiri, which name, according to Tertul-

* See also Quintinus in 'Thesaurο' Petri Burgmanni. Lugduni, 1536.

† Monsignor Dozzina, 'Acta Visitationis.'

PLATE II.



SEVEN STATUETTES FOUND IN THE RUINS OF HHAGIAR KIM, STATED TO BE IMAGES OF THE SEVEN CABEIRI.

lian, signifies *powerful* or *great*, existed on or near this village.

The Cabeiri had been the masters of the Phœnicians in the arts of commerce and navigation, and had committed to writing the theology revealed by Thoth; and, having discovered the use of simples, the method of curing poisonous bites, and the art of incantation, that is, of restoring health by muttering mysterious words, had been endowed with the title of *great*, or *powerful*.

According to Sanchoniathon the Cabeiri were seven, and seven was the number of statuettes found at Hhagiar Kim; and the peculiar form of these coincides with the description given by Herodotus (iii. 37), who tells us that the figures of the Cabeiri resembled that of Vulcan, so that they were called his children. From the context it would appear that they were dwarf gods.

This mystic number of seven is, according to Dr. Vassallo, repeated in the number of chambers of which the temple is composed. The principal section near the entrance is divided into three almost equal parts, the centre being occupied by the passage, and the two lateral parts being divided off by parallel walls, which separate the centre from a chamber placed on each side. Seven large stones, quite distinct from the rest of the building, stand at the entrance, and have, according to Dr. Vassallo, been set up as a symbol of the power and number of the deities worshipped there.

The principal section, as already stated, was divided into three parts. The size of the two chambers is 12×18 feet, and the centre occupies a space of 20×18 feet. By the shelf, or 'predella,' placed on the left of the centre passage, stood, according to the drawing given in the 'Malta Penny Magazine' above alluded to, the sacred slab; and the carved altar was found near this part of the ruins. The 'predella' is calcined, by the action of fire, to the depth of about an inch; and in one of the recesses close to this spot were found a large quantity of bones of animals, and those of dogs in particular.

On emerging from the centre passage, one enters the second grand section, which lies parallel to the first, and through which is an exit on to the north-western side of the

temple. It covers a space of 65×14 feet. Turning on the left, and after ascending some steps, one reaches another of these chambers, and three others lie parallel in succession, one near the other; they are of an average size of 32×17 feet.

Besides these large chambers, several recesses are met with along the passages and in various parts of the building. These are generally formed of three monoliths, and may have been used as places for keeping the sacred animals; and also appear to carry out the opinion of several archæologists, that this monument, besides being a place of worship, was one of burial.

It is true that the only human remains found among the ruins of Hhagiar Kim were the skull, and some of the bones of a skeleton recognised as that of an Ethiopian, but no criterion can be formed from this fact, since the place bears evident traces of having been opened at a former time.

One last particular has to be noticed; this is, that many of the stones have countless perforations all over their surface. This appears to have been the only ornament given to the enormous blocks of which Hhagiar Kim is built, and some of which are twenty-one feet long. As the Phœnicians were worshippers of the stars, it would not be unlikely that these perforations were made to represent these their tutelary divinities.

The photograph which forms Plate III. gives the southern aspect of the Hhagiar Kim ruins, and is the first of the views contained in the album laid before the Congress. On the left will be seen the principal entrance, while on the extreme right are four gigantic stones, one of which measures 21 feet, and gives a very good idea of the size and importance of these ruins.



FINAL PROCEEDINGS OF THE CONGRESS.

AFTER the Papers above printed had been laid before the Congress, and observations had been made respecting some of their contents, the subject of the destruction of megalithic monuments now going on in Brittany and elsewhere, was brought before the meeting in a letter from the Rev. W. C. Lukis, and by the communications of other members. It was thereupon determined that a Committee should be formed to take steps to arrest, if possible, the destruction of these monuments; and the following gentlemen were appointed a Committee for the purpose, viz.

Sir John Lubbock, Bart.
 John Evans, Esq.
 J. W. Flower, Esq.
 Colonel A. Lane Fox.
 Rev. W. C. Lukis.

In accordance with Art. 4 of the General Rules, the Congress then proceeded to consider in what country the next annual session of the Congress should be held.

M. Waldemar Schmidt conveyed to the meeting a cordial invitation from Denmark, and it was unanimously decided that the session in 1869 should be held in that country.

M. J. J. A. Worsaae was nominated President, and the following gentlemen were named to form a Committee of Organisation, with power to add to their numbers, viz.

M. Vilhelm Boye.
 M. Conrad Engelhardt.
 M. C. A. Gosch.
 M. C. F. Herbst.
 M. Waldemar Schmidt.
 Professor Steenstrup.
 M. C. L. Steinhauer.
 M. A. Strunck.

A vote of thanks was then carried to the various authors of memoirs and other communications to the Session; and it was announced that Mr. Brash, Mr. Busk, Sir Walter Elliot, Mr. J. W. Flower, Mr. A. W. Franks, Mr. Furse, the Rev. R. Kirwan, the Rev. W. C. Lukis, Mr. Moggridge, and Mr. Westropp had signified their intention of presenting the illustrations to their several papers. The special thanks of the Congress were thereupon voted to these gentlemen.

A vote of thanks was passed to the various gentlemen who had contributed donations of money in aid of the Congress. (See List at the commencement of the volume.)

A vote of thanks was also carried to the several donors of casts and books; especially to M. Pereira da Costa for a large collection of casts from Portugal, as well as for a number of copies of his work on the Dolmens in that country.

A vote of thanks was carried to Mr. A. W. Franks for his kind invitation of the Congress to a *Conversazione* at 103, Victoria Street (Christy Collection), on the evening of the same day.

A vote of thanks was carried to Mr. Blackmore for his invitation of the Congress to visit Stonehenge and the Blackmore Museum at Salisbury on the 31st inst.*

A vote of thanks was carried to the President, the General Secretary, and Secretaries of the Congress.

In accordance with the programme, various members of the Congress subsequently visited the Museum of the College of Surgeons in Lincoln's Inn Fields.

* The intended excursion to visit the Blackmore Museum at Salisbury did not take place, as a sufficient number of names were not sent to Mr. Stevens; but some members of the Congress subsequently availed themselves of Mr. Stevens' invitation, and visited the remarkable museum, illustrating the Stone Age in all its phases, for which the town of Salisbury is indebted to the liberality of William Blackmore, Esq.

In the evening Mr. A. W. Franks gave a *Conversazione* at the Christy Collection, 103, Victoria Street, Westminster, when the members of the Congress had an opportunity of seeing that extensive Collection of Prehistoric Antiquities and Ethnography.

Saturday, August 29.—Various members of the Congress, both Foreign and English, met at the British Museum at 10 o'clock, by the special permission of the principal librarian of that institution, and visited the British and other early antiquities, over which they were conducted by Mr. Franks.

The proceedings of the Congress thus terminated.

Erratum.

P. 68, the following paragraph should have been inserted at the close of the Meeting :—

In accordance with Art. 12 of the General Rules, a Publication Committee was appointed, consisting of the following gentlemen :—

Colonel A. Lane Fox (*General Secretary*), *Chairman*.
George Busk, Esq.
John Evans, Esq.
J. W. Flower, Esq.
A. W. Franks, Esq.
Sir J. Lubbock, Bart.
W. Spottiswoode, Esq., *Treasurer*.

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